

Engineering  
Library

# MOTOR AGE

FOR AUTOMOTIVE SERVICEMEN

NOV 18

A CHILTON PUBLICATION

EMBER 1940

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Pontiac Trans.  
Mission Service

•  
And Hundreds of Other  
Helpful & Profitable  
Ideas

1940

Super Highways and Service

SUPER SPEEDS ON SUPER HIGHWAYS DEMAND A SUPER TYPE OF SERVICE



## AMERICA HAS VOTED..AND STEEL-VENT WINS

★ All hail the victor! The Steel-Vent "Tough But Oh So Gentle" platform sweeps the country.

Millions of motorists have swung to this new, revolutionary idea of oil control. With their savings jingling in their pockets they (by their purchases) voted Hastings Steel-Vent first among all oil-rings for replacement.

HASTINGS MANUFACTURING COMPANY, HASTINGS, MICH.

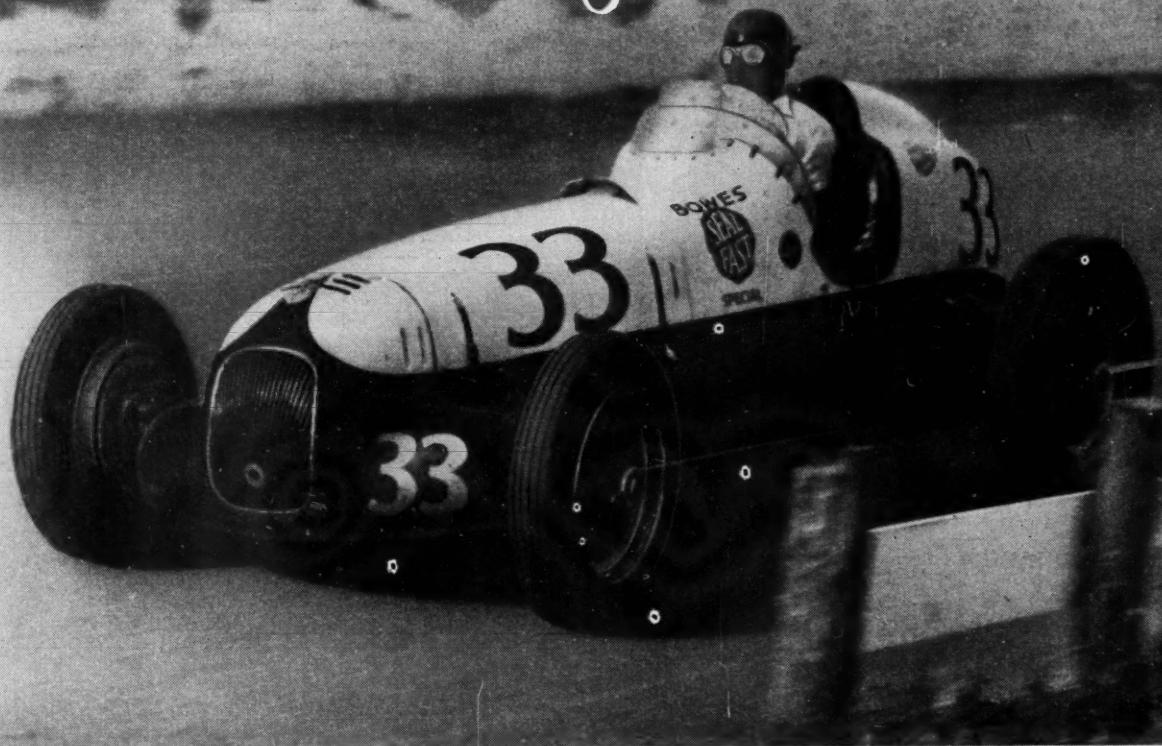
*Piston Rings • Piston Expanders • Valv-Rings*

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#### A BETTER SPARK PLUG FOR BOTH YOU AND YOUR CUSTOMERS

A better spark plug for your customers because Bowes Spark Plugs have proved their ability to "put out"; their ability to "take it" under the most extreme conditions on the toughest testing grounds

in America. A better spark plug for you because its proven performance assures you of customer good will . . . and . . . equally important . . . because you know you will never be underpriced on Bowes Spark Plugs.

#### YOU'LL GET INCREASED SPARK PLUG SALES AND . . . BETTER PROFITS WITH BOWES PLUGS

We have developed a special merchandising plan in connection with our new plug tester and cleaner that is greatly increasing plug sales for Bowes dealers. Use the coupon below to get details of the plan.

HERE, SURELY, IS CONVINCING  
PROOF THAT BOWES SPARK  
PLUGS ARE  
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ROBERT M.  
BOWES

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Bowes "Seal-Fast" Corp., Indianapolis, Ind.

M-11  
Sure, I want to increase my plug sales . . . and I'll "listen" if you'll have the Bowes "Seal-Fast" distributor in my territory call and explain your special plan.

Name.....

Address.....

City..... State.....

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to these  
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THREE outstanding additions to K-D PRODUCTS  
... for flat or corrugated surface mounting...  
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oblong—with  
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Note: These are built SHALLOW for protection against sidewise scraping.

Write for new Catalog No. 40  
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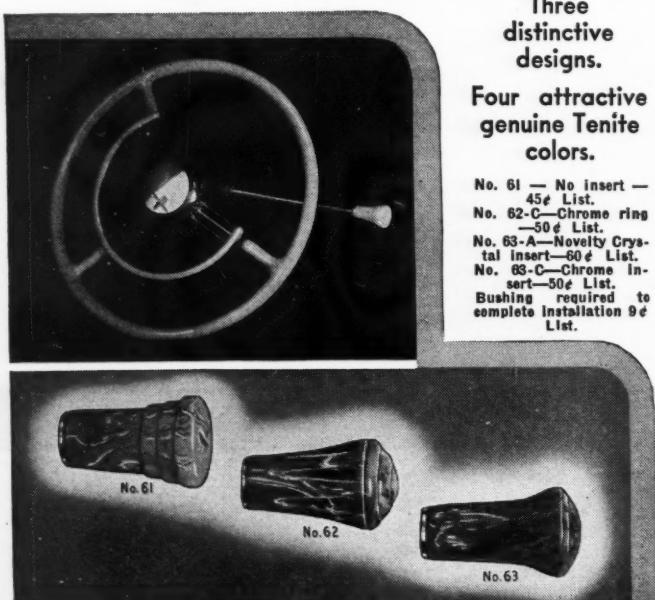
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# MOTOR AGE

With Which is Combined AUTOMOBILE TRADE JOURNAL

## FOR AUTOMOTIVE SERVICEMEN

Vol. LIX, No. 12

November, 1940

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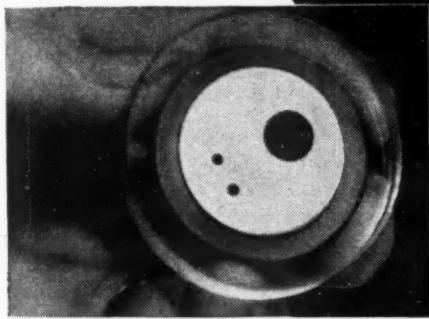
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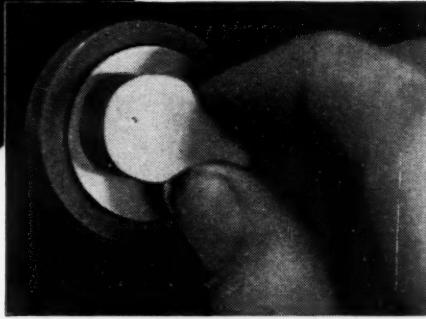
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## MOST ACCURATE TEST FOR SURFACE FLATNESS

"Optical Flats", special glass discs with surfaces so perfectly flat they can be used to detect the slightest imperfection in plane surfaces.

# ARO

## LUBRICATING EQUIPMENT

Outstanding performance, dependability, and long life are the results of scientific design, finest quality materials, and the work of skilled craftsmen such as are employed in the manufacture of ARO Lubricating Equipment, Pneumatic Tools and Aircraft Products.

For example: one of the vital parts of a Pneumatic Lubricator

is the air valve. Above pictures illustrate the precision with which the sliding contact surfaces of finest nitr alloy steel are finished.

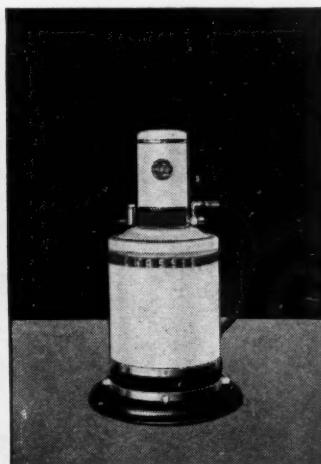
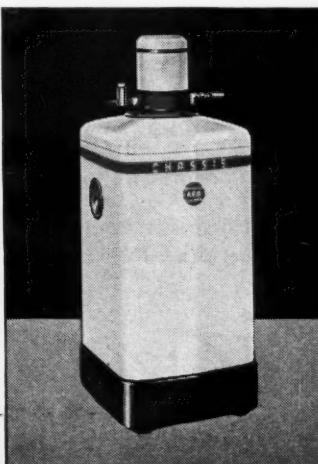
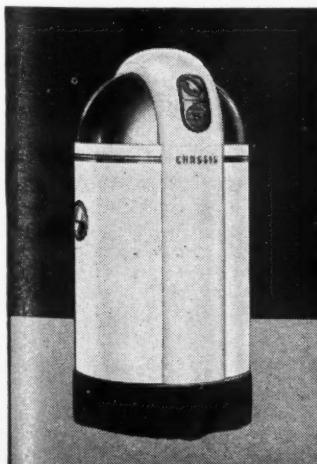
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## ARO AIR VALVE PARTS MUST PASS THESE TESTS

So accurately finished they will adhere to each other like the Precision Gauge Blocks shown above. Perfect air seal is positively assured.

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BRYAN, OHIO, U.S.A.



# 3 Great Lines 3 Advertising Campaigns 3 Profit Opportunities



THE Dodge-Plymouth "Triple-Profit" dealership, long recognized for its profit-building possibilities, has now been made even more attractive.

Just look at the coverage you get!...not one, but three popular products that blanket the market where four out of five sales are made...

And not one, but three powerful advertising campaigns to bring buyers to your doors!

**Money-maker No. 1—Dodge Luxury Liner for 1941**...Bigger, more handsome, alive with selling advantages! Lowest-priced car to offer Fluid Drive, recognized as one of the major automotive advancements of all time...destined to rank, in importance, with the safety-steel body, hydraulic brakes, Superfinish and Amola Steel, all of which—and many others—Dodge pioneered!

**Money-maker No. 2—Plymouth for 1941**...The "One" for '41 in the lowest-priced field! Now

offers 19 important selling advancements, including Powermatic Shifting...magnificent new styling...new fashion-tone interiors...increased horsepower.

**Money-maker No. 3—Dodge Job-Rated Trucks for 1941**...A complete line (1½-ton to 3-ton) that enables you to meet more than 97% of all hauling needs! Every Dodge Job-Rated Truck is powered and "sized" for the job it is built to do—a powerful sales advantage. 112 standard chassis and body models...18 different wheelbases...6 great engines, including the remarkable heavy-duty Dodge Diesel. And priced with the lowest!

#### A TIMELY TIP

There may be an opportunity with the Dodge-Plymouth dealership in your community. If the territory is open, why not get our new "Triple-Profit" proposition? Drop a line today to Forest H. Akers, Vice-President, Dodge Division, Chrysler Corporation, Detroit, Michigan. Correspondence confidential, of course.

## The Triple-Profit Dealership

**DODGE • PLYMOUTH • DODGE Job-Rated TRUCKS**

# MOTOR AGE

NOVEMBER

1940



## Shop Talk

### Harvest

If the service station and repair shop operation expects to harvest any profits during the fall and winter season he has to plant some seeds in the form of advertising which will bring the customer to his shop. In addition, he will have to use modern equipment in order to not only do the jobs in the shortest time possible, but also to cultivate the favor of his customers.

### Auto Show

In spite of having seen all of the new cars in September, I got a big kick out of the show at New York.

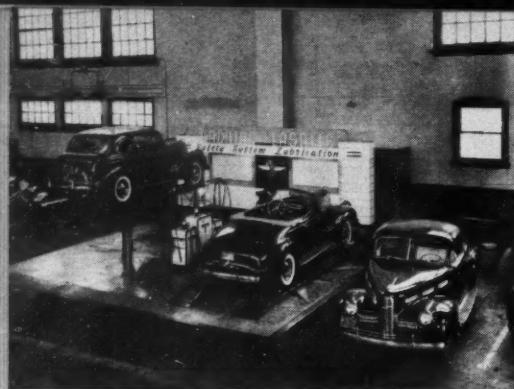
Of course, the cars were displayed much better than they were at the previews and at the car dealers. In addition, there were a lot of stripped models (cars, not females) that are a big help in studying details of construction. I wish I could have spent more time on the fourth floor where they had the antique cars. They sure had a fine collection of cast iron wonders.

### Shop Kink

One thing's sure, and that is I now know how to remove a front main bearing on a Plymouth without removing the timing case cover.

You will recall that last month I suggested on this page that a method of removing a Plymouth main bearing would be a good subject for a Shop Kink. Close to 50 different readers sent in their pet methods, and more are still coming in. It is interesting that after a close study of the letters, there appears to be two main methods: 1—where you crack off the corner of the die cast seal; 2—where you drill out the cap screw. Details of the two methods are given in the shop kink section.

*Bill Toboza*



These are pictures of a service department where maintenance is big business. Eierman Cadillac-La Salle Co. devotes thirty thousand sq. ft. of floor space to service



Headquarters for Eierman Cadillac is Pittsburgh's famous old Motor Square Garden. Its well-equipped service department handles 900 jobs a month, grosses \$10,000 monthly

Eierman Cadillac of Pittsburgh operates a busy, all-service maintenance department. Two lubricating lifts with cabinet type equipment are shown in the left photo. Wheel alignment and pick-up service are shown.

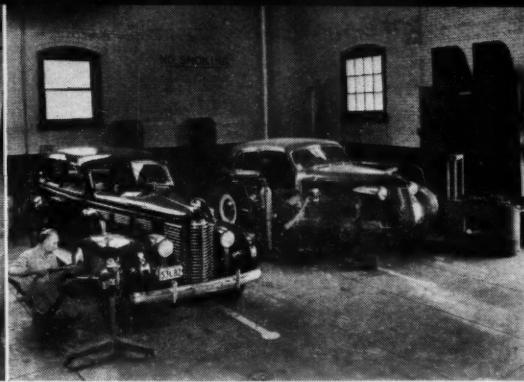
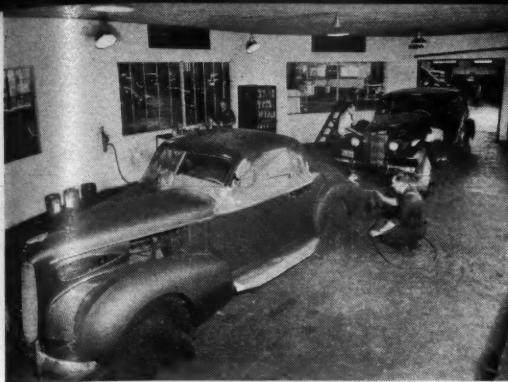
# Super

By FRANK TIGHE

WHAT was once the show place of Pittsburgh is now the show case for modern cars and one of the finest super maintenance set-ups in the country.

Motor Square Garden — where Harry Greb and Jack Dempsey and Gene Tunney fought, where Pittsburgh's automobile shows were annually held—is now the home of Eierman Cadillac-LaSalle Company.

Eierman Cadillac is doing a super maintenance job in Pittsburgh. Thirty thousand sq. ft. of floor space in this building, which covers a city block, is devoted entirely to complete automotive service. Here, 60 cars can be serviced at one time. Here, 50 workmen are kept busy turning out approximately 900 jobs



Highlights of the Eierman Cadillac service departments are shown here. Left to right, across this page, is the paint department, a section of the fender and body repair department and a view of the electrical, battery and carburetor department. Spray painting department accommodates five cars. A modern ventilating system

changes the air in the room every three minutes. Body and fender repair department is equipped with welding equipment, straightening machinery and a portable power grinder. Motor analyzer, exhaust gas analyzer are important pieces of equipment found in the electrical department shown at the extreme right

# Maintenance IN PITTSBURGH

**Pittsburgh's Motor Square Garden is now the home of Eierman Cadillac - LaSalle, where maintenance plays a very important part in company earnings.**



Pittsburgh's famous Motor Square Garden now houses a famously successful service department.

a month, earning a gross of approximately \$10,000 monthly. An average of \$11 per job!

Here is the super service method of doing business applied to a large establishment with no gasoline sales to establish quick contacts with the motoring public. Eierman Cadillac

services all makes of cars, although only a small percentage of its business comes from makes other than the lines handled.

Completeness of service facilities is the magnet that attracts business to this service department. Modern, artistically decorated depart-



Spencer King, Eierman Cadillac-LaSalle service manager

ments, up-to-date service equipment, alert, uniformed workmen with good tools, an adequately stocked parts department . . . all these tend to stimulate that constant flow of trade so necessary in super maintenance.

How is the consumer's dollar spent in the service department of Eierman Cadillac-LaSalle Co.? We put that question to E. H. Newmeyer, secretary-treasurer of the company. Mr. Newmeyer, incidentally, is credited by H. D. Eierman, president of the concern, for the success of the tremendous job of altering and decorating the old Motor Square Garden.

(Continued on page 60)

**By DON RAY**

**1. Valve adjustment.** The rapid change of temperature occasioned by winter driving makes periodic attention to valve tappet clearances necessary. Overhead valve adjustments are easy, but the valves in the L-head engines are hard to reach. Where manufacturers' specifications call for a certain tappet clearance "Hot" and the mechanic sets the adjustment "Cold", at least .001 in. should be added to the "Hot" clearance.

**2. Spark Plugs.** Cold weather driving is tough on spark plugs. Every winter tune-up job should include cleaning the plugs and inspecting them for cracks, leaks or burned electrodes. Replacement should be made at 10,000 mile intervals.

**3. Distributor points.** Setting the gap is only a part of the tune-up job; points should be inspected for wear and replaced if necessary. Check the distributor shaft for wear in the bushings, test the automatic and vacuum advance, and inspect all cables. Set ignition timing with a timing light or tachometer.

**4. Refacing valves.** No winter tune-up job is complete without a compression test of each cylinder. This often shows uneven compression due to poorly seating valves or worn rings, and these conditions will cause hard starting. Corrections are necessary if the owner is to enjoy uninterrupted use of his car during cold weather.

**5. Carburetor adjustment.** A slightly rich idle adjustment makes cold weather starts easier. Check the fast-idle adjustment and put the accelerating pump connecting link in the hole providing the longest stroke. Inspect linkage for wear, and set the float level to specifications.

**6. Battery testing.** Cold weather places a heavy drain on the battery. Frequent testing will detect possible trouble before failure occurs.

**7. Battery Cables.** Poor connections mean electrical failures and hard starting. Cleaning battery terminals is important, and badly corroded terminals should be replaced.

**8. Charging rate.** Generators with an adjustable third brush should have the charging rate increased for winter driving.

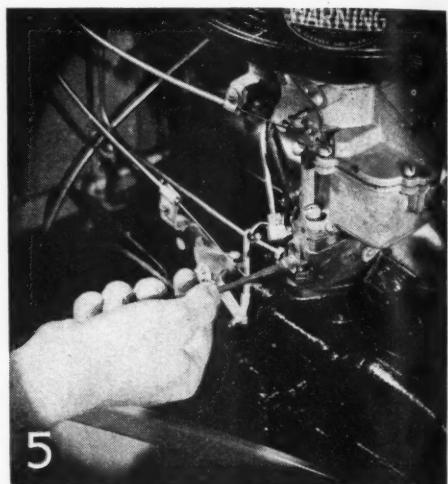
**9. Voltage regulator.** Generator output of late model cars is controlled by voltage and current regulators. Test the operation of the regulator to insure proper maintenance of the battery voltage.

**10. Cooling system.** One of the main points of a winter tune-up is cooling system service. This means cleaning the radiator core and the water passages on the head and block with a good cooling system cleaner, checking for leaks, installing new hose connections, and inspecting the fan belt.

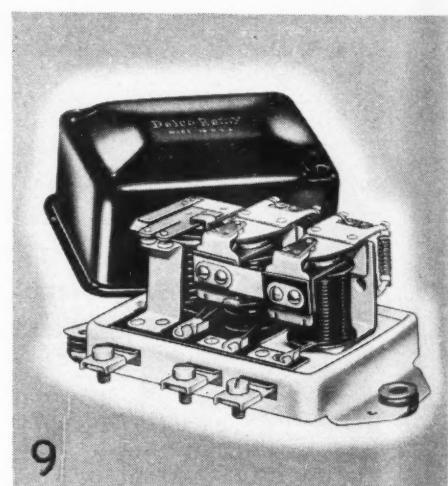
**11. Anti-freeze.** Provide anti-freeze protection for the lowest anticipated temperature. Test the solution frequently.

**12. Front wheel alignment.** is another point in the winter tune-up job. A careful check of caster, camber and toe-in, with corrections made where necessary, means improved handling, ease of steering and reduced tire wear.

**13. Brake adjustment.** is doubly important during the winter months, because unequal brake application on snow or ice-covered roads produces skidding.

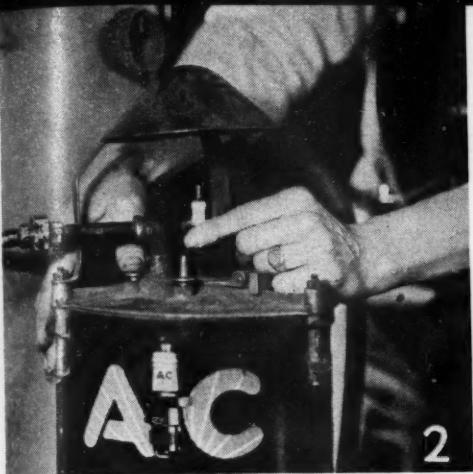


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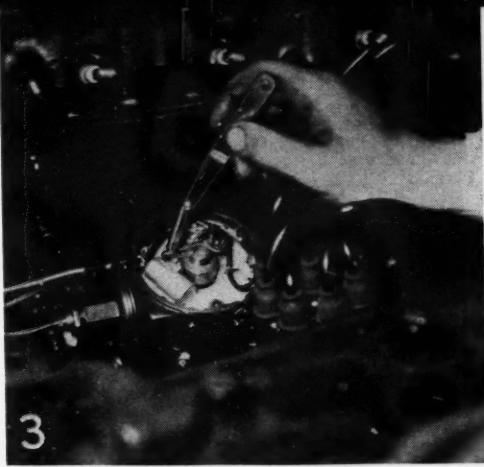


## CHECK LIST FOR COMPLETE

**Provide your customers with uninterrupted transportation during the winter tune-up which protect against cold weather failures and hard**



2



3



4



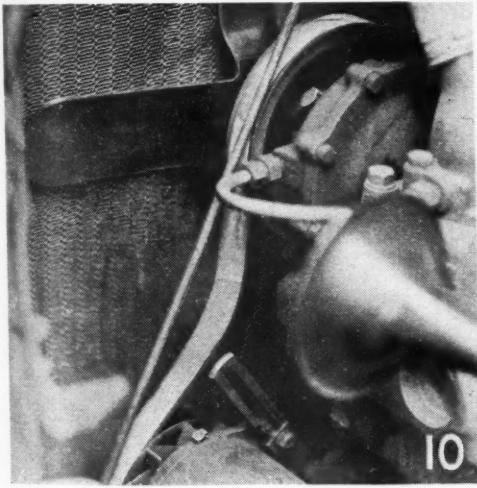
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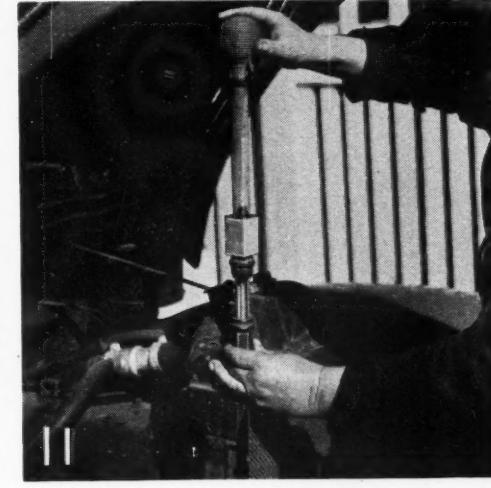
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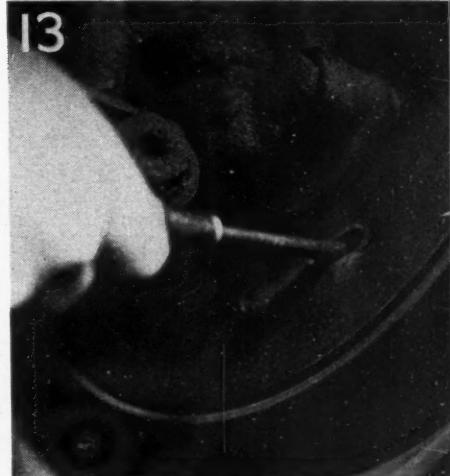
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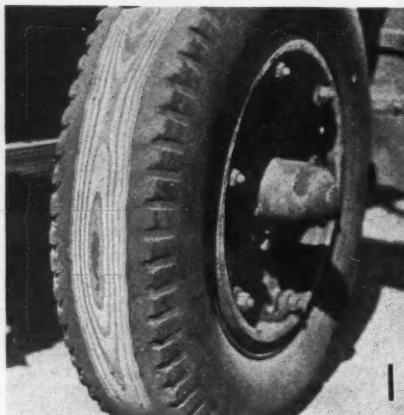
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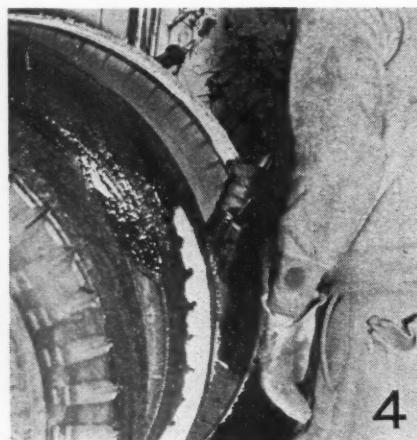
# WINTER Tune-Up

**winter months by proper attention to the points of starting. Here are some hints covering the work**



# RETREADING Tires

***Thousands of miles can be added to the life of truck and bus tires through retreading—and profits added to the till of the shop equipped to do the job***



1

A few years ago this tire would have been discarded as worn out. But with present methods of tire reconditioning it can be restored to useful life through retreading.

2

When it arrives at the shop it is given a thorough inspection for cuts, bruises or any breaks in the fabric that would weaken the carcass. If none are found, the tire is judged suitable for retreading.

3

It is placed in a buffering machine and all traces of the original tread rubber are buffed off, leaving a smooth surface.

4

A coating of fast-holding cement is applied to the outer surface of the tire.

5

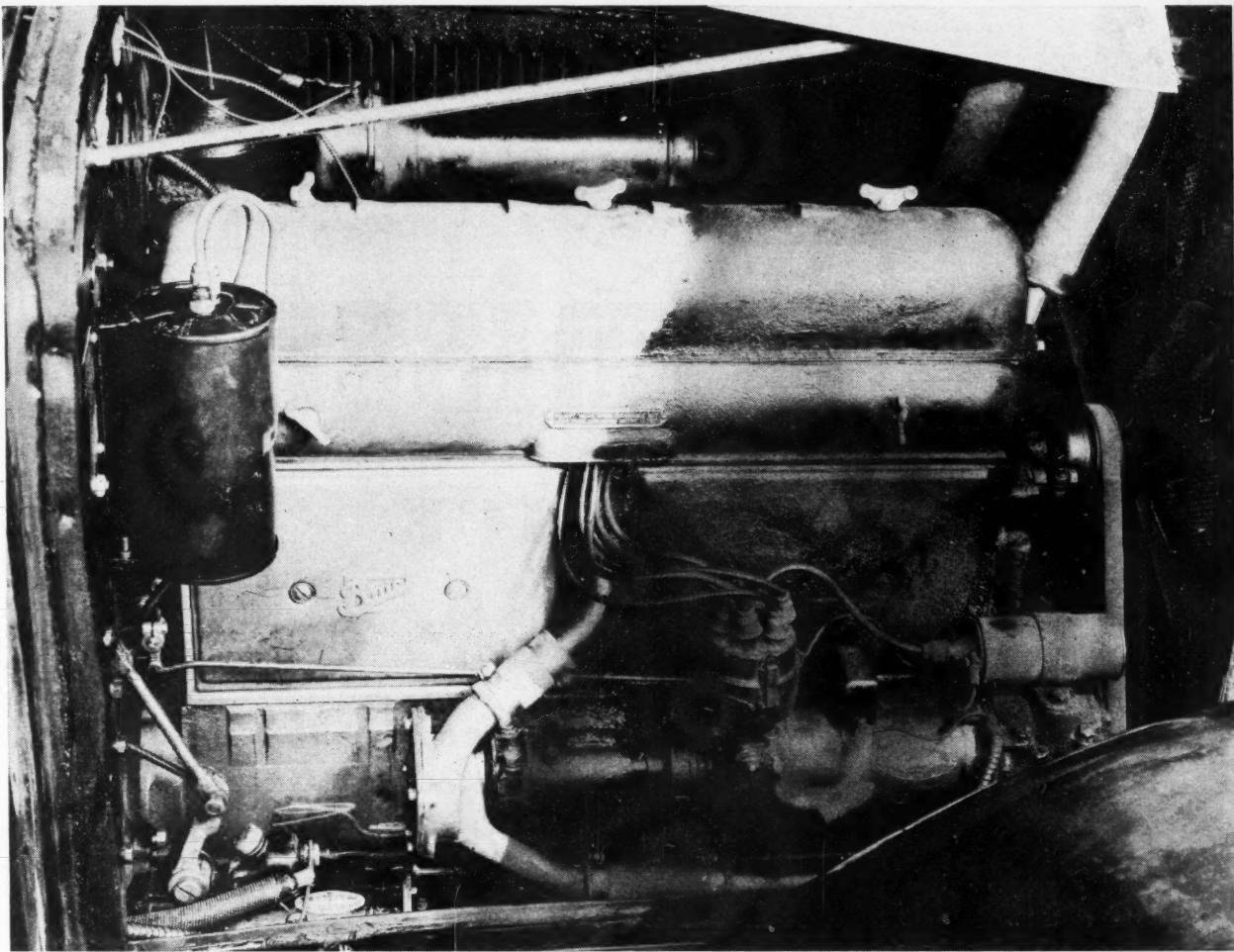
The new tread stock is put in place around the circumference of the tire, the cement causing it to stick firmly to the tire.

6

The tire is then placed in a mold and heat is applied for two or three hours. This vulcanizes the new tread rubber to the old tire, and at the same time molds the tread pattern.

7

The retreaded tire is removed from the mold, trimmed, and then is ready for the road.



# UNDER-THE-HOOD **Washing**

***A clean engine not only looks better and increases engine operating efficiency, but it also adds another safety factor to general car operation.***

THE favorite outdoor sport of many car owners is washing and polishing their cars on Saturday afternoon or Sunday morning. They like to see the car shine—it increases their pride of ownership.

But they never think of washing

the engine or the under side of the chassis. In the first place, those parts are too dirty and greasy, and in the second place they don't show when the car is going down the street.

Yet there are very definite rea-

sons why the engine particularly should be washed clean, aside from the appearance angle. A dirty engine, coated with oil and grease, is a fire hazard. An electrical short in the wiring, or a back-fire in the carburetor is much more likely to cause a serious fire when the engine is covered with oil and grease than if the engine is clean. In addition, the thick coating of oil and grease on a motor cuts down its efficiency and may cause it to heat up. While the cooling system solution is employed to control the engine operating temperature, radiation from the engine block plays

*(Continued on page 60)*

# 1941 PONTIAC

# Transmission

## SERVICE

***With the paint hardly dry on the new models, here is an article on disassembling one of the major units. You'll want to keep it handy for reference.***

### 1

Remove the screw that attaches the transmission shifter shaft lever to the selector shaft, and remove the lever, spring extension, spring yoke and spring. Remove the transmission cover. Remove the speedometer driven gear, sleeve and shaft assembly. Shift the transmission into high gear, remove the rear bearing retainer - to - case screws, and draw the rear bearing retainer, main shaft and second speed gear as a unit out through the rear of the transmission case.

### 2

Remove shifter fork lock screws. Shift the selector shaft to neutral and remove the shifter lever lock screws. Slide the shifter shafts out through the rear of the case, being careful not to lose the poppet balls and springs. Lift out the sliding sleeve and the low and reverse sliding gear.

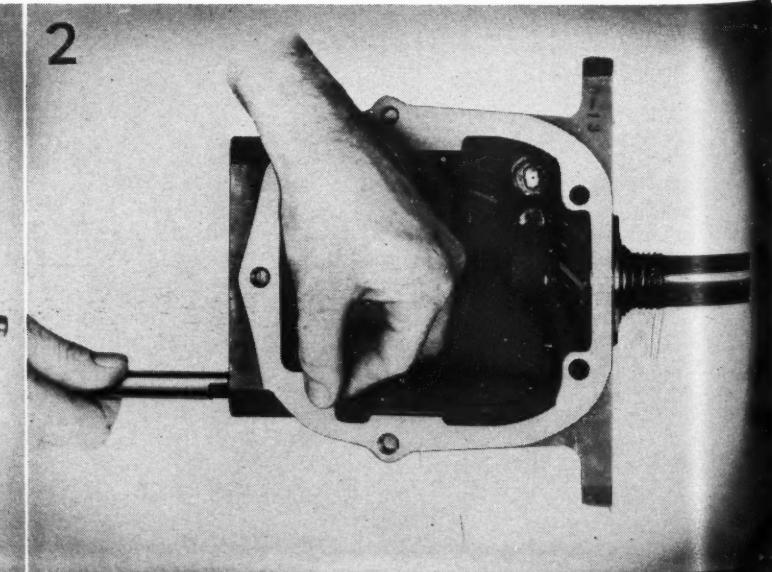
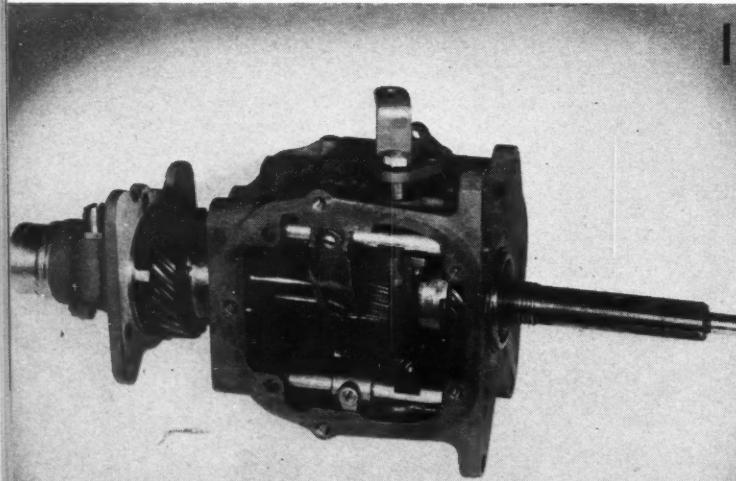
### 3

Loosen the screw which clamps the transmission selector shaft lever and remove the lever. Drive the selector

shaft from left to right out of the case. (Note: the shaft will knock out the welch plug in the right side of the transmission case as it comes out. Use a new plug when reassembling, and install the selector shaft from the left side of the case.)

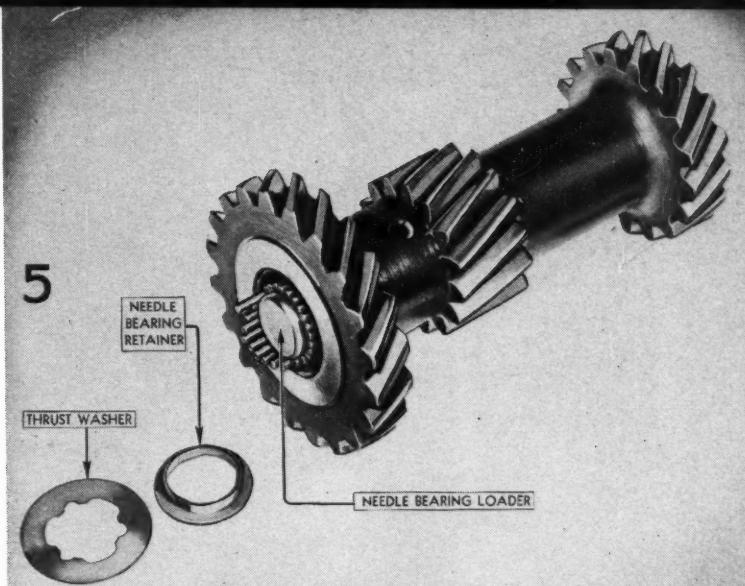
### 4

When reinstalling the inner selector shaft, check the order of assembling the oil seal and washers. The leather oil seal is pressed into the left side of the transmission case with the lip of the seal toward the inside of the case.



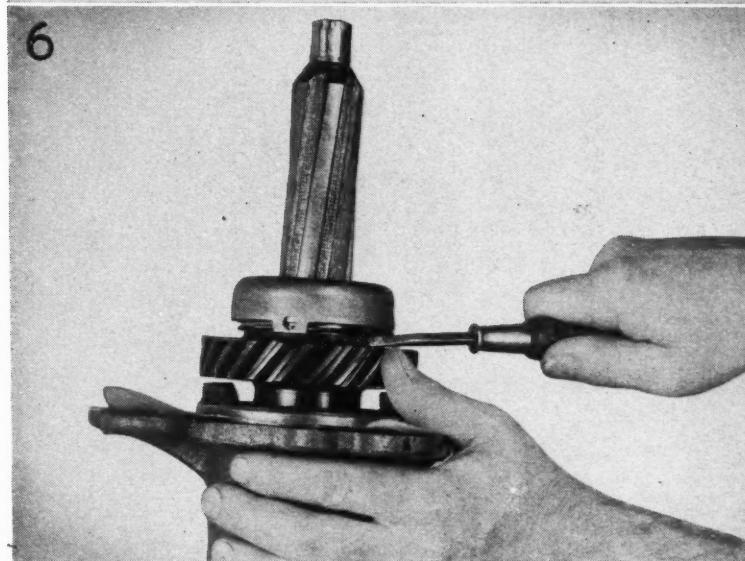
5

Drive the counter gear shaft out from front to back. (Note: this shaft is fitted with needle bearings front and rear, and in order to prevent the bearings from falling out, use a shaft the same size as the countergear shaft, but shorter. With this shaft used as a drift, it will enter the countergear and hold the needle bearings in place.) Rest the countergear in the bottom of the case.



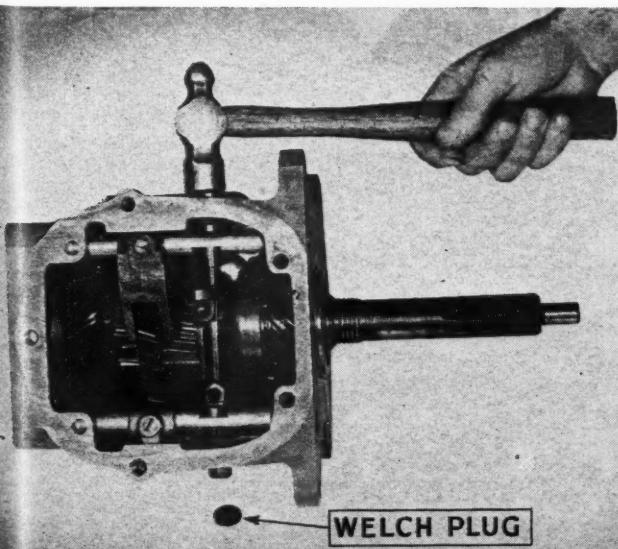
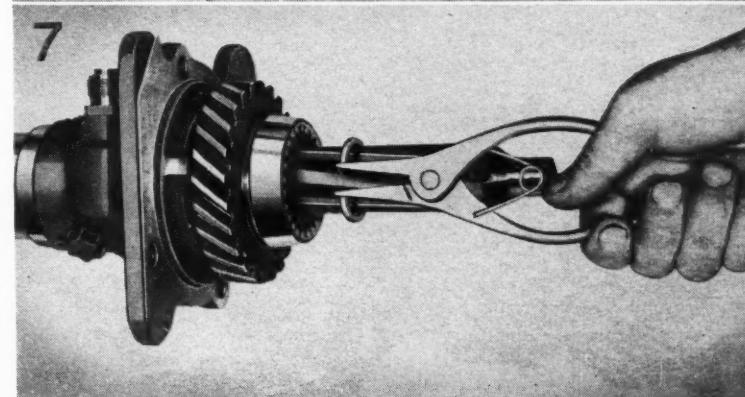
6

Remove the snap ring from the outside of the front bearing and drive the main drive gear and bearing through the case from front to back, removing it through the top of the case. Then lift out the countergear. Remove the reverse idler gear shaft lock pin by driving it toward the inside of the case, and remove the idler shaft and gear.

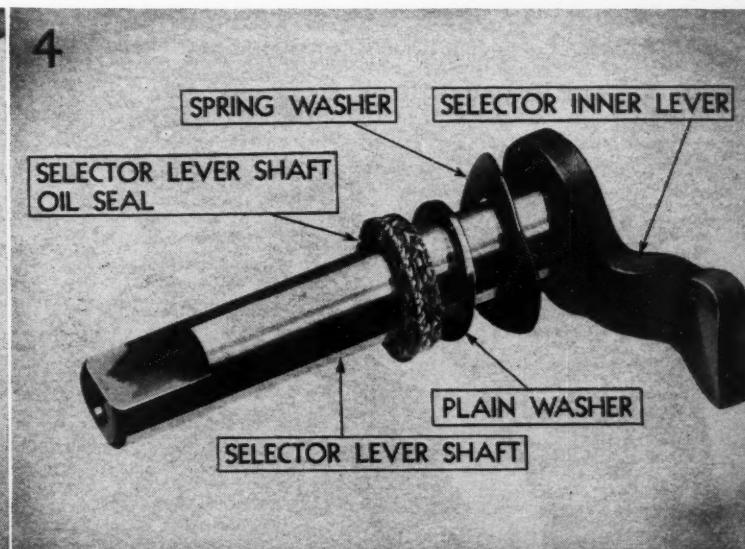


7

Expand the wire retainer in the second speed gear synchronizing drum, and remove the drum from the gear and shaft, leaving the retainer in the drum. Remove the main shaft snap ring and thrust washer inside the cone of the second speed gear and slide the gear off the main shaft. Care should be exercised in removing this snap ring so as not to bend it or spring it so much that it will not spring back to its original shape. If it is bent or sprung, a new snap ring should be installed. To disassemble the main drive gear, expand the wire retainer and remove the synchronizing drum. Remove the front bearing retainer snap ring and spring washer and remove the bearing by thumping the end of the shaft on a block of wood.



3





## IT ISN'T HARD TO

SERVICE station operators complain about a good many things, but there is one complaint that is practically unanimous — bad accounts. Find one serviceman who doesn't have anywhere from a dozen to a hundred or more deadbeats on his books and you've almost got something that Ripley could use in *Believe It or Not*. Well, fellows, I'm one shop owner who isn't letting out even a small-sized squawk about delinquent accounts.

My books show a total of one long overdue account since Sept. 1, 1938, and this bring my net losses chargeable to unpaid accounts to an even 27c per \$1,000.00 of business done.

Now I want you to get me right at the start; I don't claim to be a financial wizard, a high-pressure collector, nor do I have any magic tricks that reach into a customer's pockets and draw forth both coins and folding money. I'm just an average sort of a guy (I hope) who

runs a small shop, does the major portion of the work himself, gets a lot of fun out of being in business, and wants the government to leave him alone. And before someone stands up and says I don't have what you can call credit losses because I don't give any credit, let me say that an average of 60 per cent of my business is done "on the books."

For a matter of 12 years I managed a shop for another fellow. You

know how that is; I did all the hard work in the shop while he sat in the office and looked wise. He also was supposed to look after the books, collect the accounts and pay the bills. Since he could only pay the bills and the wages if and when he collected, there were plenty of times when I went on short pay and the jobbers had an exceedingly hungry look. Instead of going out after the money, he liked to play the Big Business Man with an Andrew H. Brown complex. It was beneath his pride to admit that he was hard up and needed cash for the payroll; rather he would spout



to customers about how many thousands of dollars' worth of business he did last month.

Going on to the logical conclusion, the customers figured this way: "If he's doing so much business he must be making plenty of money and the little I owe him he'll never miss. Guess I'll just stall

him along for a while." And I'm telling you, brother, that is just what plenty of them did. I remember one time when he wrote \$30,000.00 off the books at one sweep. You can't keep doing things like that and stay in business. He didn't.

I had all this as an object lesson before I started my own shop. Right from the start I decided that when I gave credit I was going to collect it, and if I couldn't collect I wasn't going to give it. I made up a few simple mental rules along these lines.

(1) I was going after credit customers as far as possible among fleet owners and business men.

(2) I would give credit to individuals only if they were recommended by the local credit bureau, had responsible jobs, lived within their means, or were known to me personally to be okay.

(3) Any account that went unpaid over 30 days was to get a telephone call; an account 60 days old was to get a personal face-to-face call, and any account over 90 days old was to get the works at least once a week from then on. How this plan has worked out can be seen from the fact that for every thousand dollars I've earned I've lost 27 cents. I'll admit that sounds

too good to be true, but wait, you've only heard half my story.

I am no professor of psychology —nor even a serious student of the subject—but I do think I've learned a little about people. Hardly any two are alike, and the method you can use to successfully collect from one won't pry a dime from another. That's the reason almost all form letters are the bunk. I don't read the ones the other fellows send me,



and I doubt if they'd read any that I could write. A form letter looks like a form letter, and you can't make it look any different. About the only good you can chalk up to form letters is that they supply the raw material for starting fires in the furnace.

I use letters to collect bills from out-of-town customers, but each letter is individually written to that person. More often I send a telegram if the amount is large. In

(Continued on page 76)

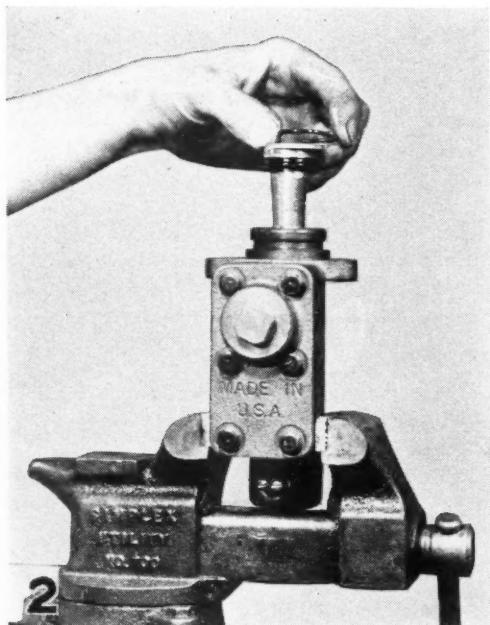
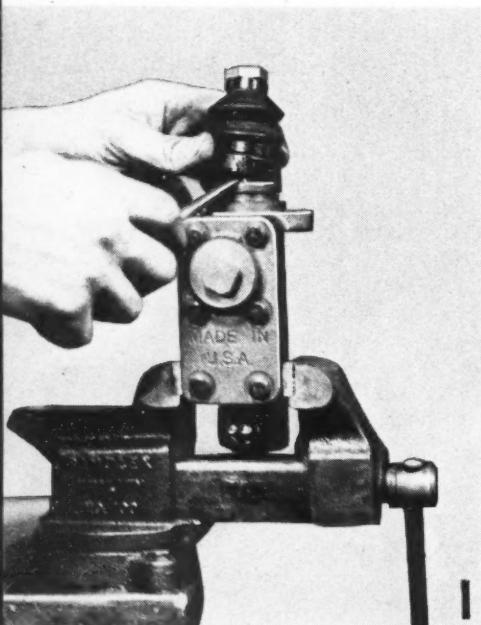
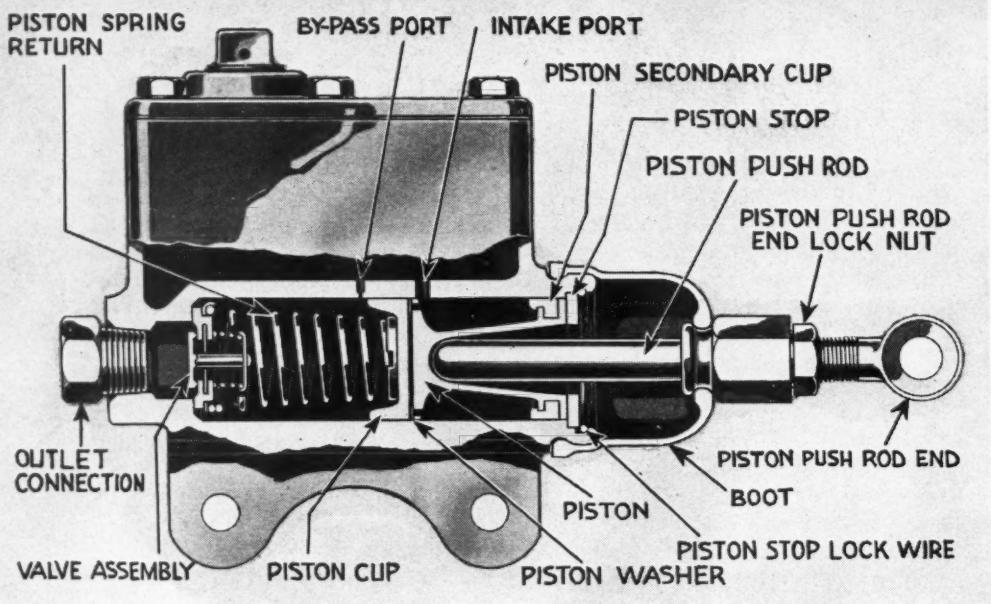
# Collect Bills



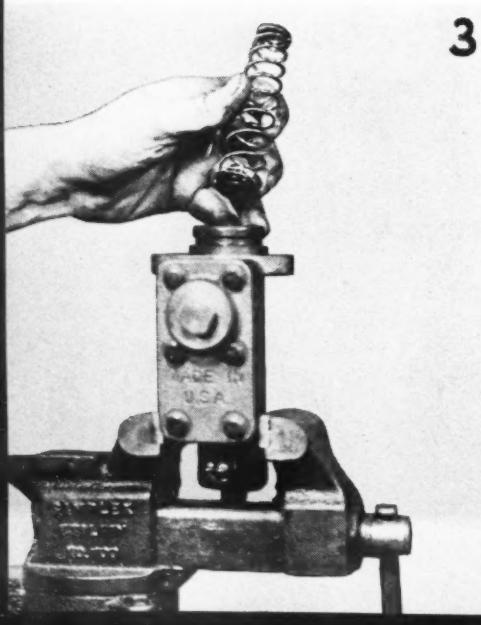
**Here's a straight-forward discussion by a serviceman, telling others how to beat the dead-beat; or how to give credit and get cash**



**By JACK BEATER**



## HYDRAULIC



**1**  
Remove clamp ring fastening boot to master cylinder, and remove boot and push rod.

**2**  
Remove piston stop lock wire and piston stop washer, and lift out piston.

**3**  
Remove the piston return spring and the check valve.

**4**  
Check the cylinder with a Go and No-Go gage to determine if the cylinder has been honed before and is now too large to stand another honing. If the gage enters the cylinder it indicates that the cylinder is too large, and should be replaced.

**5**  
Honing the cylinder should be very carefully done, removing only enough stock to smooth up the walls and eliminate any scratches or pits.

# Brake



## 6 & 7

Honing the cylinder places a sharp edge around the by-pass port. This should be burred off to prevent it from wearing the piston rubber cup. Special pliers are available, having a sharp dowel slightly smaller than the port. This dowel is inserted in the port, and a slight pressure applied to remove the sharp edge.

## 8

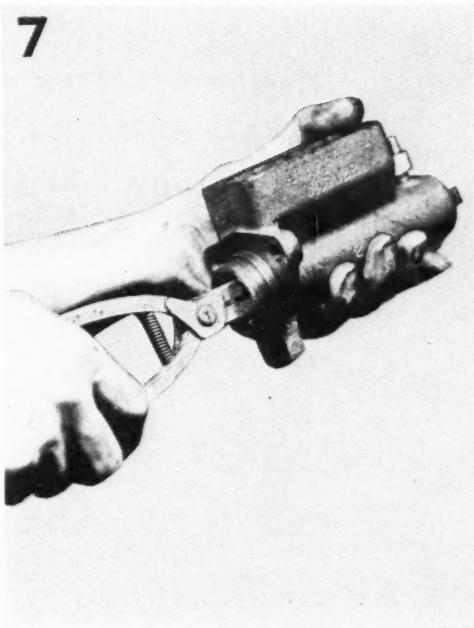
Check the size of the by-pass port with a wire gage. The "go" gage is .117 in., and the "no-go" gage is .126 in. If the "no-go" gage enters the port it indicates that it is too large, and the cylinder should be replaced.

## 9

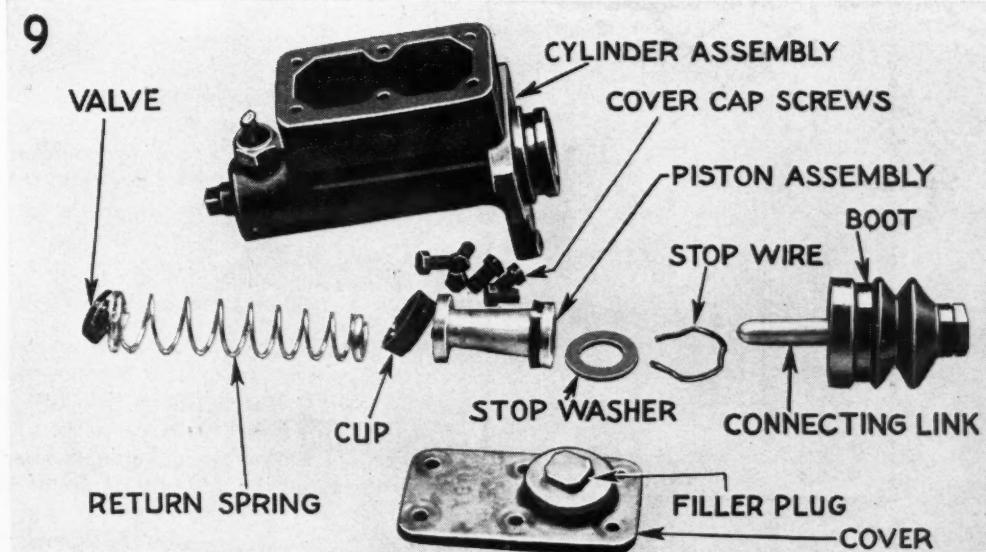
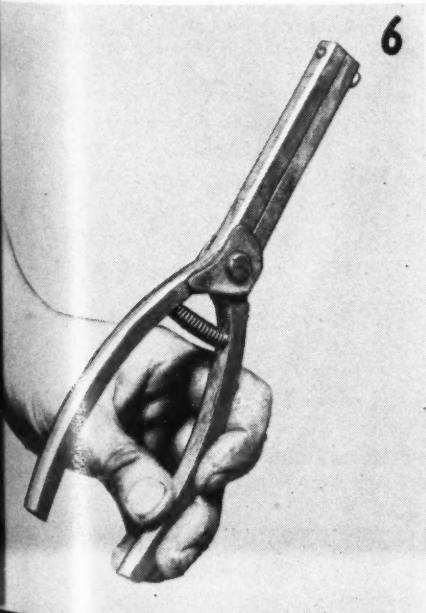
Wash all parts in alcohol, and when reassembling, all parts should be dipped in hydraulic brake fluid. Use new primary piston cup, new secondary cup and new check valve. Never wash hydraulic brake parts in gasoline, kerosene or oil.

## **Honing the combination type Wagner Lock-head hydraulic brake master cylinder**

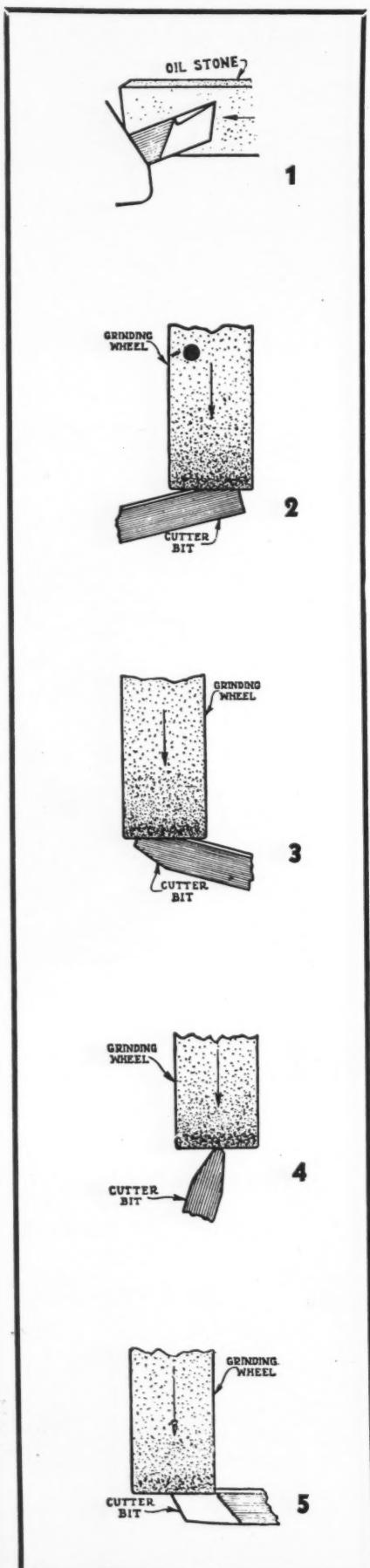
By BOB HANKINSON



## **CYLINDER OVERHAUL**



# GRINDING ROUND NOSED



# Lathe Tools

## For General Purpose Work

**You can't turn a smooth surface with a dull tool. Follow these instructions when sharpening tools not only for engine lathe work but brake drum turning as well**

1

First grind the left side of the cutter bit, holding it at the correct angle against a coarse grinding wheel. After removing most of required metal in this manner, finish on the side of a fine wheel. Dip the cutter bit in water frequently in order to prevent over heating.

2

Grind the right side of the cutter bit. The angle need not be accurate. Only don't remove any more metal than necessary, as the larger the bit, the better it will conduct heat.

3

Grind the radius at the front end of the cutter bit. This radius should be about 1/32 in. in diameter. A large radius causes chatter. Be sure to hold the tool at the correct angle to give proper front clearance. Cutter bit should be swung from side to side in order to obtain the correct radius.

4

Grind the top of the cutter bit, holding the cutter at the correct angle in order to obtain the necessary side rake and back rake.

5

With an oil stone, hone the cutting edge all around and on top until the cutting edge is very keen.

Note: See the article in the September issue entitled "Sharpening Lathe Tools" which explains the different angles of the lathe tool.



## WOMEN LIKE



Gone are the days when milady was subject to such cruel and barbarous treatment. Today, super service provides the kind of merchandising most women are accustomed to find in department stores and shops.

WHEN readers are asked what they prefer in their trade magazines, they give overwhelming preference first, to "how-to-do-it" articles (in our case, how to repair automobiles) and second, to articles discussing ways of getting new customers.

Readers tell us that this is practical information—of concrete help in the running of a shop. We have tried each month, therefore, to sug-

gest where you might find new business, and what you could do to bring it into service station.

We've been preaching the gospel that the woman driver is a potentially big factor in the buying of automotive service; that, although service men seem loath to admit it, still the nearly 8,000,000 women who now drive cars in the United States buy a whale of a lot of gas, oil, accessories, and repairs; that

these women would buy even more if the products were made more accessible and attractive to them.

You know yourself that women will spend hard-earned money to buy the most outlandish things simply because they were bargains, or because the item was cleverly displayed. How often have you heard some woman (usually your wife) say, "Well, it seemed like a good

(Continued on page 90)

# Super Service

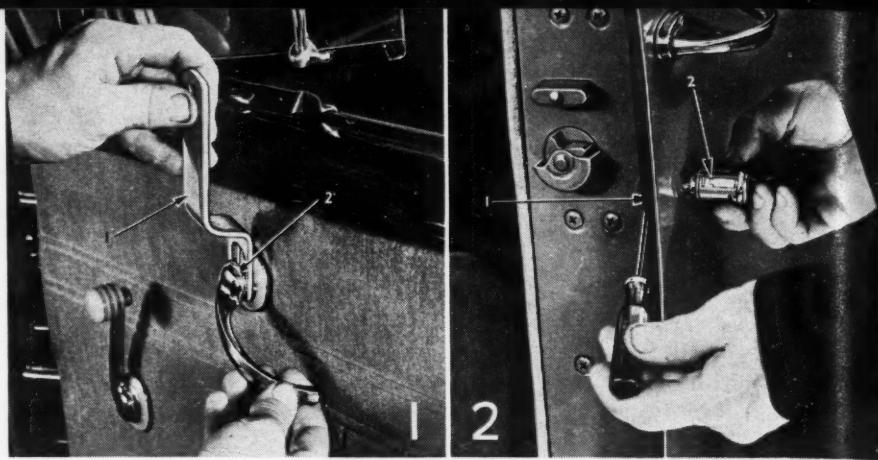
***The department store idea in selling service, where all types of repairs can be bought quickly, appeals to the great majority of women drivers***

**By ROSE LU GOLDMAN**

**By BILL TOBOLDT**

### DOOR INSIDE AND WINDOW REGULATOR HANDLE REMOVAL

Press escutcheon plate against trim panel, exposing pin which holds the handle to the shaft. Then push pin out of shaft with special tool. This will permit removal of handle and escutcheon plate by simply pulling them from the shaft. Fig. 1.



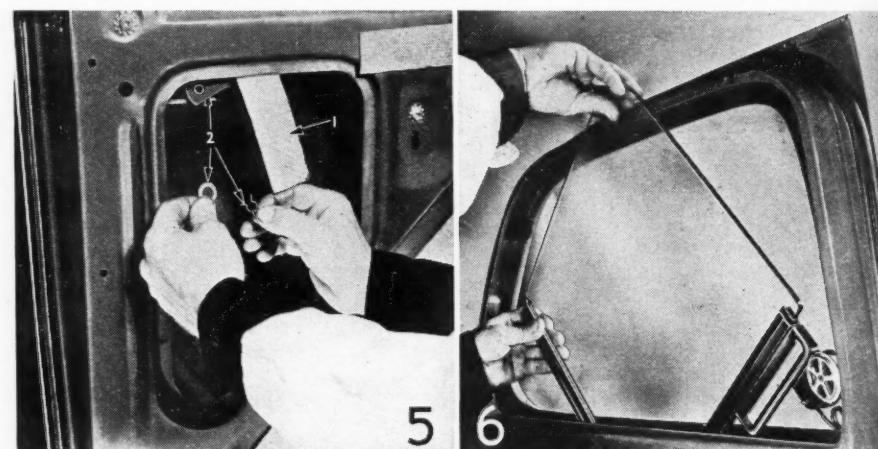
### DOOR LOCK CYLINDER REMOVAL

Loosen set screw 1, Fig. 2, in the edge of the door frame. Then pull out lock cylinder. When installing the lock cylinder, turn the lock to the unlocked position with the key. Then turn the bearing for the lock cylinder shaft (washer with square hole) to the right as far as it will go. Then push a long needle through the trim panel and on through the lock cylinder hole in the door. Press the end of the lock cylinder shaft against the needle point and allow the needle to go back through the door, the needle serving as a guide for the lock shaft. Tighten the lock cylinder set screw when the cylinder is tight against the door panel.



### FRONT DOOR GARNISH MOLDING REMOVAL

Lower the window as far as it will go. Remove the garnish molding screws and pull the molding away from the door at the top. Then push the complete assembly upward to unhook it and lift it from the door. Fig. 3. Install by reversing the procedure.



### DOOR TRIM PANEL REMOVAL

Remove door inside and window regulator handles and then the screw from the inside end of the door handle shaft. Pry the panel away from the door frame, unsnapping the concealed wire fasteners, which are on both sides and bottom of panel. Panel can then be removed by pulling it downward. Fig. 4. On two-door sedans, the trim panel is also fastened at the center by means of a snap fastener.

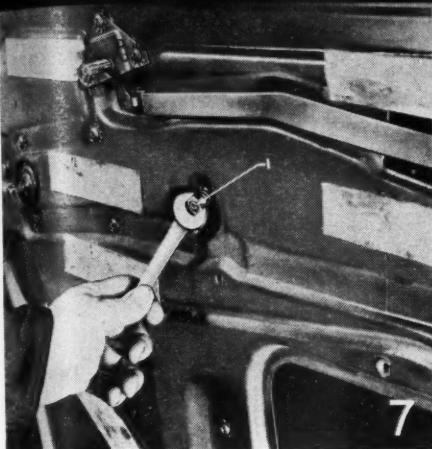
### FRONT DOOR VERTICAL SLIDING GLASS REMOVAL

Remove door inside handles, garnish molding and door trim panel. Then lower the glass as far as it will go. Remove the glass run from the door reveal and then remove the retainer

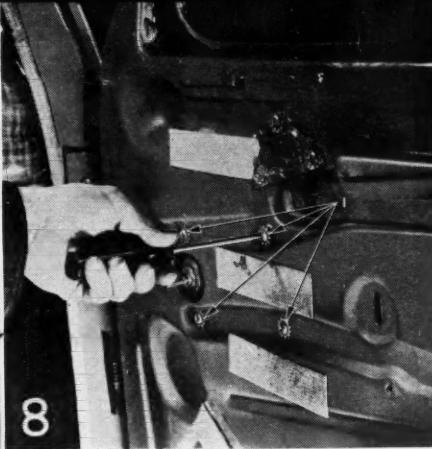
## SERVICING 1940

washer lock wire from the front and rear lift arms. Then remove the washers from each regulator arm. Fig. 5. Unhook the regulator arm from the glass lower channel and raise the glass about 4 in. Remove the glass by tipping it toward the front of the car as

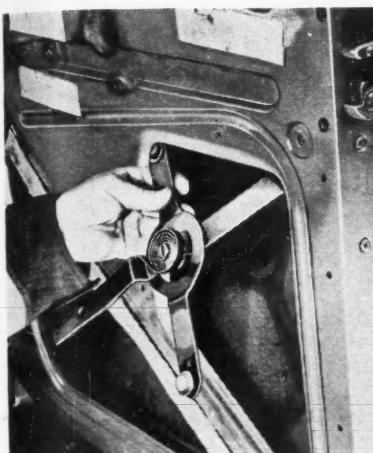
shown in Fig. 6, until the glass run roller at the front of the glass assembly can be pulled through the enlarged opening at the rear of the window opening. Remove the channel and molding from the glass by driving them off with a block of wood and a mallet.



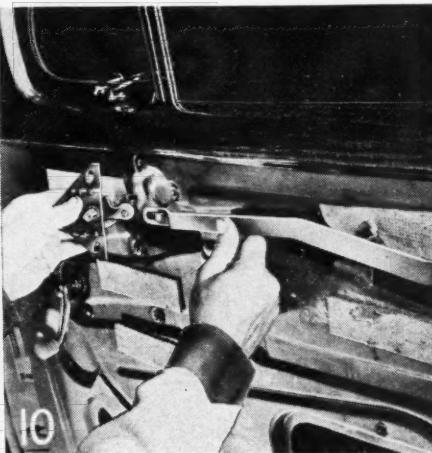
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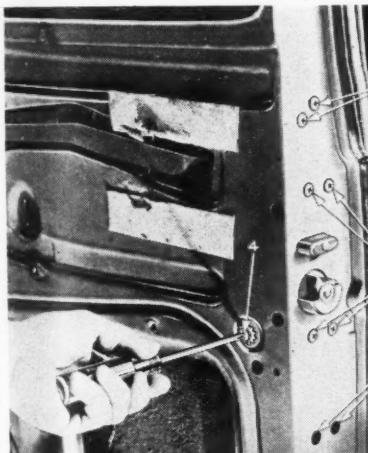
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9



10



11



12

#### FRONT WINDOW LIFT REGULATOR REMOVAL

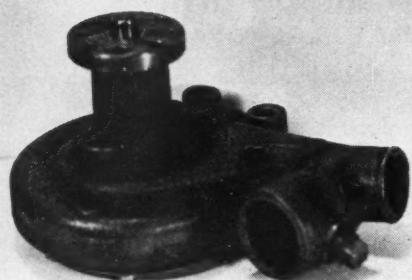
Remove door inside handles, garnish molding, door trim panel and vertical sliding glass. Remove adjustment bolt and washers Fig. 7. Wind the window regulator up and unhook the attaching stud in the back of the panel. Turn the window regulator with the crank handle in the direction of lowering. Unhook the regulator arm from the regulator body. Remove the screws Fig. 9, which hold the regulator body to the door panel and the regulator body can then be removed, Fig. 8. To install—Turn the regulator handle so that the arm is in the raised position. Hook the regulator arm on the regulator body. Turn the regulator handle so that the arm is in the raised position. Hook the regulator arm into the channel in the back of the panel. Install the adjusting screws and washers.

#### FRONT DOOR LATCH AND REMOTE CONTROL REMOVAL

Remove door inside handles, trim panel and lock cylinder. Remove the 3 screws which hold the remote control base to the inside panel of the door and unhook the base from the remote control bar Fig. 10. Remove the door outside handle screws and pull out the handle and shaft. Remove the two lower screws and loosen the two upper screws 1, Fig. 11, which hold the lower glass run channel. Remove the four screws which hold the latch assembly to the door, also the screw which holds the latch assembly to the inside panel of the door. Lower the latch assembly through the opening in the door panel, Fig. 12. It may be necessary to bend the strap outward from the door a little so that it can be guided out through the opening.

# PLYMOUTH Bodies

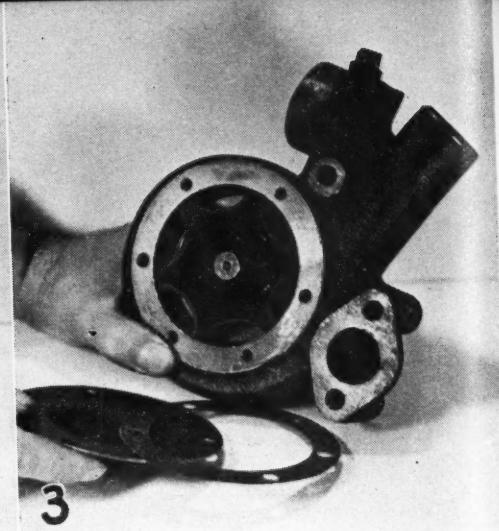
***There's no mystery in servicing Plymouth bodies  
when you follow the above procedure, which also  
applies to other cars built by Chrysler***



12



3



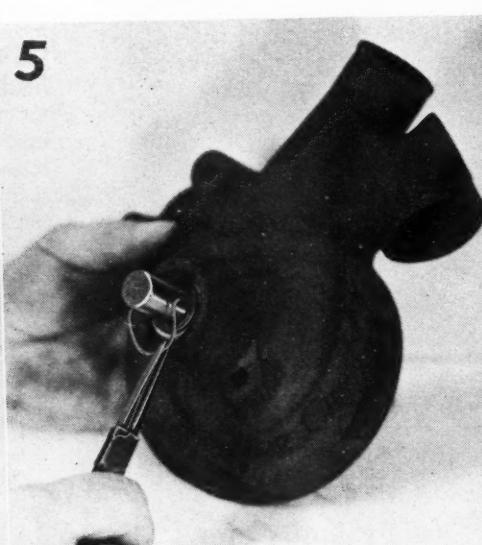
# 1940 BUICK Water

*This pump will interchange with 1937-38-39 models. By*

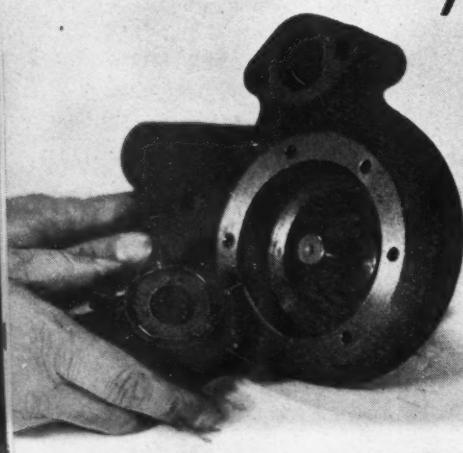
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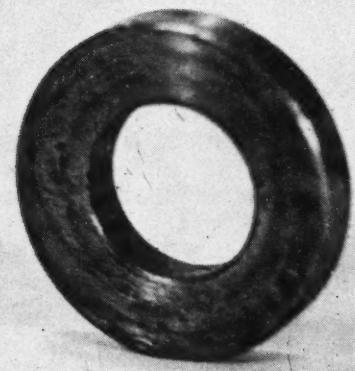
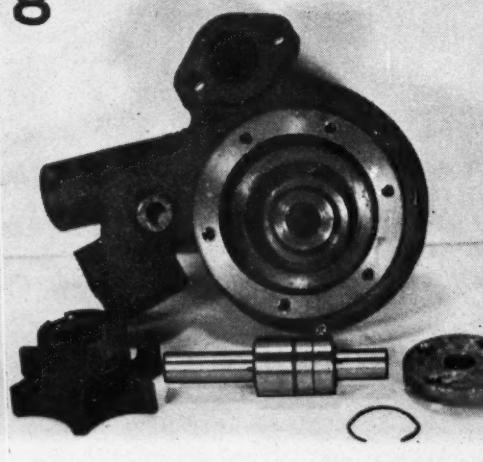
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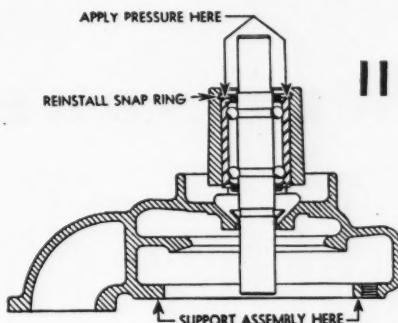
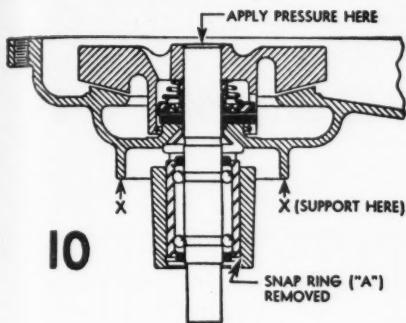


7 8



9





# Pump OVERHAUL

*using fan pilot ring it may also be used on 1936 and earlier models.*

1. Pump assembly. The ball bearing of the pump is sealed at each end to exclude dirt and water and is lubricated for life. The non-adjustable self-aligning packless seal consists of a special rubber cap which fits tight and seals on pump shaft and is held in contact with the sealing disc by spring pressure. The seal assembly is held in impeller by a snap ring. The seal assembly turns with shaft and impeller and forms its seal by contact of sealing disc against the contacted surface of the pump body.

2. Remove the six screws holding the cover plate to the housing.

3. Remove the cover plate and gasket.

**By BOB TURNER**

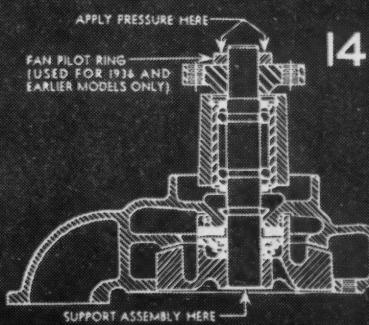
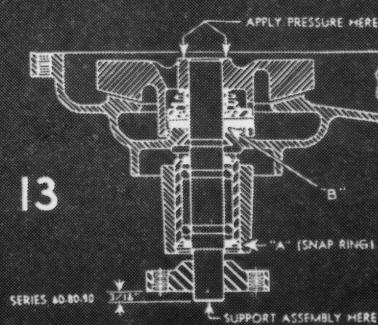
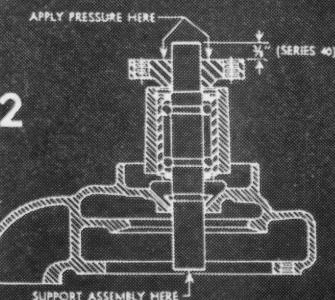
4. Remove the fan hub from the shaft.
5. Remove snap ring holding bearing and shaft assembly in housing.
6. Remove shaft and bearing assembly and impeller and seal assembly. (See No. 10 for correct method of supporting pump when doing this operation. Nos. 11, 12, 13 and 14 show correct dimensions for various models. Apply a small quantity of cup grease to impeller end of pump shaft as

shown by arrow "B" in illustration No. 13. This will protect rubber seal from becoming damaged when impeller is pressed on shaft. Also apply a small quantity of cup grease to sealing disc and to surface in pump body against which it turns. This will assist initial sealing of pump and provide lubrication until seal is run in.

7. Impeller and seal are not serviced separately.

8. Impeller and seal assembly, bearing and shaft assembly, locking ring and fan hub are sold as an overhaul package for this pump.

9. By using this fan pilot ring in front of the fan hub, this pump may be adopted to 1936 and earlier models.

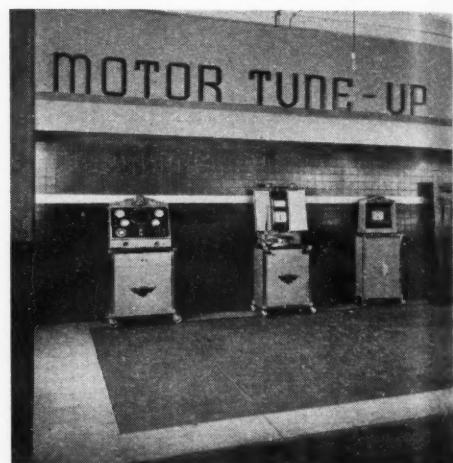


WHAT THE WELL-DRESSED SHOP

# Shop Equipment and



PROSPECTS STOP, LOOK AND BUY AT OPEN DISPLAYS



EQUIPMENT SELLS TUNE-UP JOBS

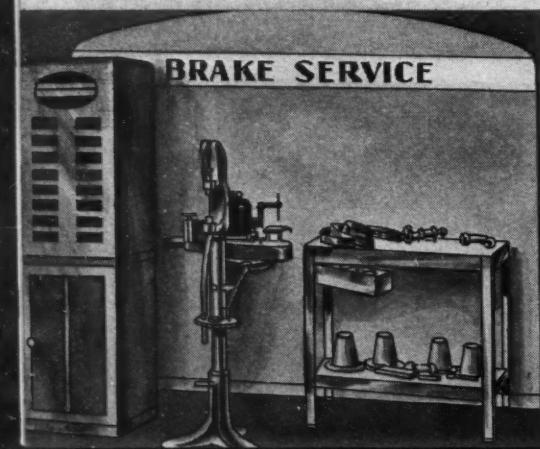


DISPLAYED ITEMS REMIND CUSTOMERS

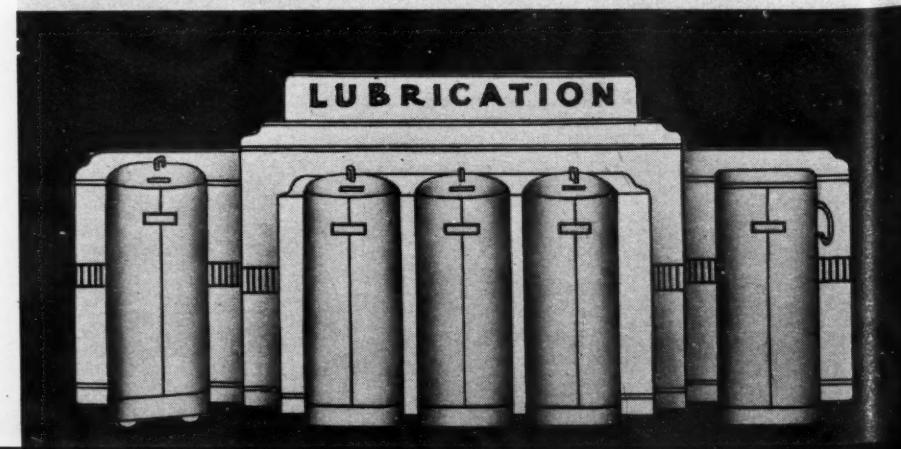


WORK BENCHES AND TOOL RACKS ARE GOOD SHOP FURNITURE

STAND-OUT DEPARTMENTAL DISPLAYS

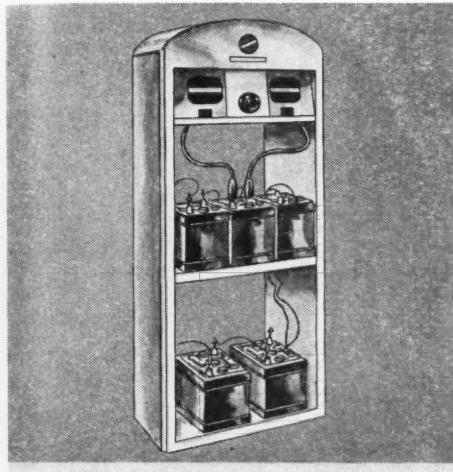


COMBINE SHOWMANSHIP AND UTILITY IN BACKGROUND DISPLAYS



IS WEARING

# Product Displays



USE MANUFACTURERS' DISPLAYS



CLEAN AND COMFORTABLE WAITING ROOMS



LOOKING at it from a customer's point of view, your shop is one big display of the merchandise and service you sell. If it's a good display you sell plenty, for display is vital in all point-of-sale selling.

Much has been said about shop cleanliness as a factor in attracting business and impressing buyers favorably . . . but no profit-seeking shop operator can afford to overlook the importance of shop furnishings. And by shop furnishings we mean all of that which goes into your shop after you have cleaned the walls, hung the banners and washed the mechanics' faces.

Good shopkeeping takes it for granted that you should use elbow grease to get rid of shop grease, that service stations should be cleaned regularly. The next step is good display. M. D. Douglas, Chevrolet parts and accessory manager, has a swell definition . . . "Good display," he says "makes passers stop! Makes stoppers look! Makes lookers buy!"

You can apply this to your own business by making your whole shop a "display window." Make every merchandise display pay its way; make every piece of shop equipment tell its own story and

(Continued on page 74)



***The shop owner who gets the most out of his shop equipment and displays of merchandise learns to cash in on showmanship values***

**By PETER FOLWELL**

# WHY ARE Chemicals ADDED TO Oil?

***This article tells the story of "doped" oils and explains what results are accomplished by this phase of oil refining***

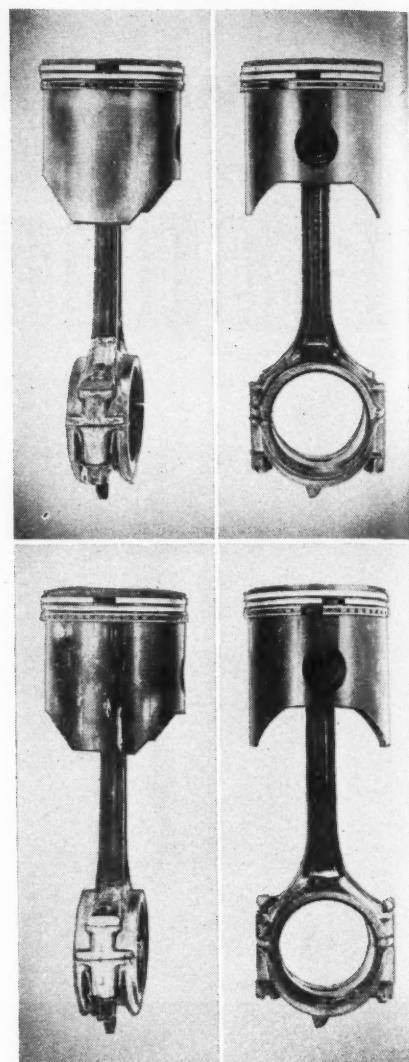
**By HENRY JENNINGS**

SOME fellows like one brand of oil, and some like a different brand. Each fellow will defend his choice, basing his opinion on a certain quality he finds in the oil which, to him, makes that particular brand of oil a little better than any other. Regardless of what this particular quality is, the oil refiners have heard about these likes and dislikes on the part of users,

and in an effort to settle the arguments they have resorted to adding various manufactured chemicals to their oils to get the characteristics required for certain classifications of service.

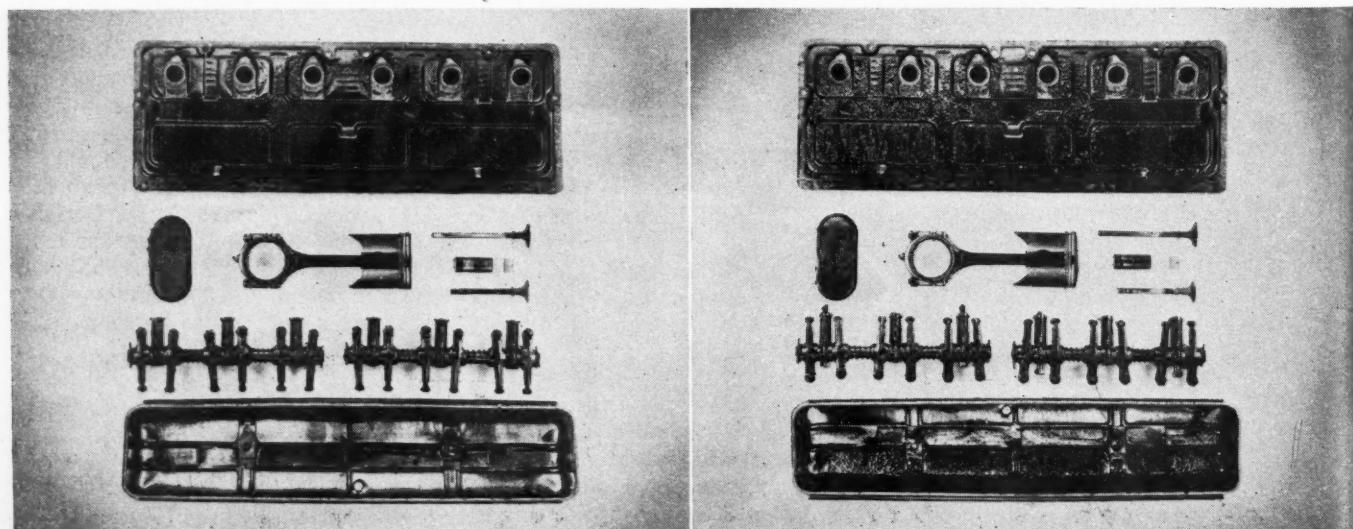
These chemicals, because of their complex composition and construction, have long, unpronounceable names. Wrestling with the chemi-

(Continued on page 80)



Above—the upper illustration presents two views of a piston removed from an engine operated at 60 m.p.h. road load with treated oil, while the lower view is of two pistons removed from the same engine operated under identical conditions but with untreated oil. Note varnish deposits from untreated oil.

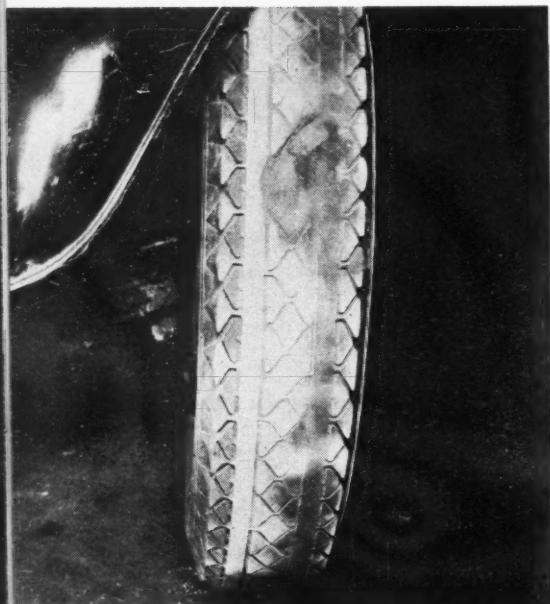
Below—other parts of the same engine. Parts in left illustration show conditions after running with treated oil, while those on the right show accumulations from untreated oil.



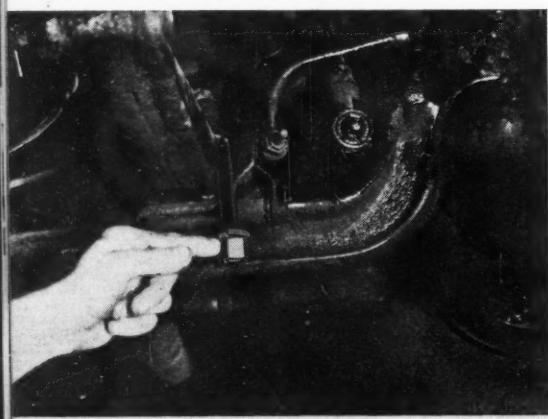


"McGinty, you're the bottleneck of Super Service, Inc.!"

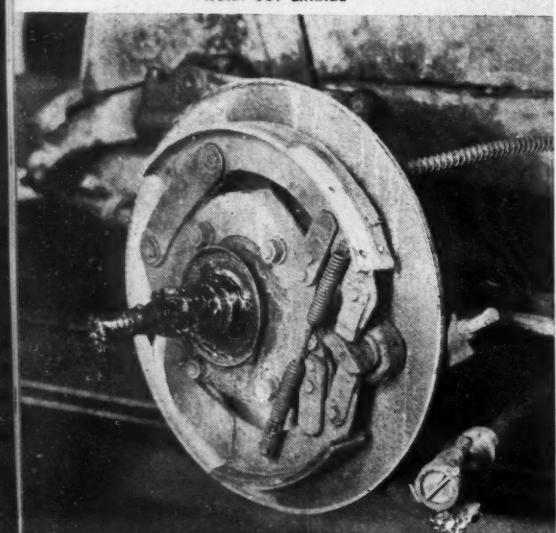
# SAFETY INSPECTIONS



IMPROPER ALIGNMENT



LOOSE "U" BOLTS



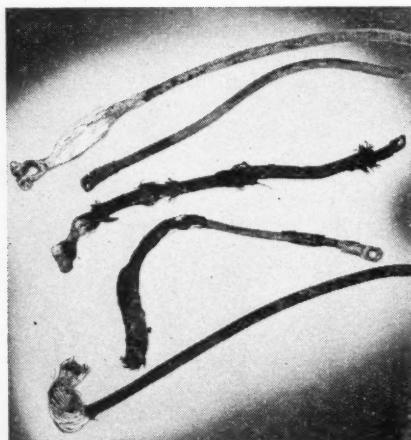
WORN OUT LININGS

***Carry on your own safety inspection campaign by checking your customers' cars regularly and providing the "service" cure for motor vehicle accidents***

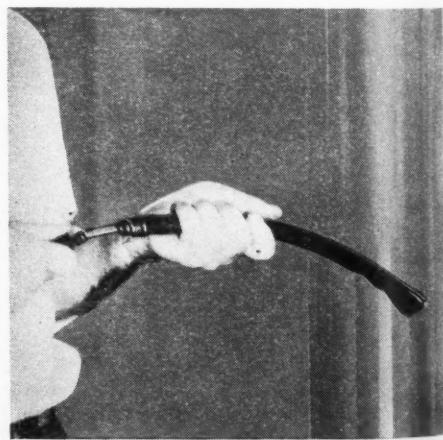
WITH many American communities carrying on successful programs of safety inspection for its motor vehicles, many things are revealed about maladjustments of cars, which if caught

in time would cause reduction in accidents.

Although slippery road conditions, intoxication, fast and reckless driving generally are given as the major causes of accidents,



WORN OUT BATTERY CABLES



FROZEN BRAKE CABLES



OBSTRUCTED VISION

# YIELD SERVICE PROFITS

it becomes evident from careful inspection of motor vehicles that the physical condition of the car's units and the car as a whole must not be overlooked as a likely cause.

"Only a very small per cent of accidents are due to the mechanical condition of the cars," some collectors of statistics tell us. But what is there to say when the results of many nation-wide safety inspections of cars show that twenty-five per cent of the cars on the highways today are being driven with brakes far below the standard for good brakes? And the standard is attainable in most cases because it has been set low enough so older cars are not penalized through inability to have their brakes rebuilt to pass the tests.

And what about the cars rejected because of faulty lighting, defective steering and so on. The records have it that the average results of any "safety lane" or inspection of cars in any community results in rejecting cars for the following reasons:

Brakes	.....	25%
Headlights	.....	35%
Steering	.....	7%
Misalignment	.....	6%
Tail-lights	.....	6%
Wipers	.....	5%

An average of 40 per cent of registrations are rejected and many of them for deficiencies in more than one of these items.

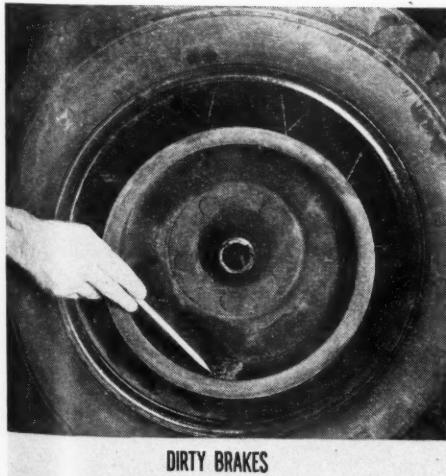
Memphis, Tennessee, undertook periodic inspection of motor vehicles early in 1934. The universal satisfaction of car owners, service shops and people in general has

made the Memphis Plan a model on which many other cities have built or are contemplating safety inspection programs.

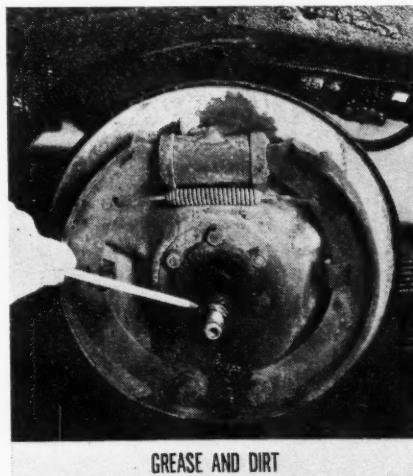
One outstanding thing brought to light by safety inspections is that safety means the ability to stop. Slowing down or stopping a motor vehicle depends upon two things. First, the reaction time of the driver. Second, the condition of the brakes and the road surface. Numerous tests have shown that the average driver's reaction time is five-eighths of a second. That is, it takes him that long to apply the brakes after he is aware that this is necessary in an emergency.

If a car is going sixty miles per hour and an emergency appears, the driver's thinking distance

(Continued on page 86)



DIRTY BRAKES



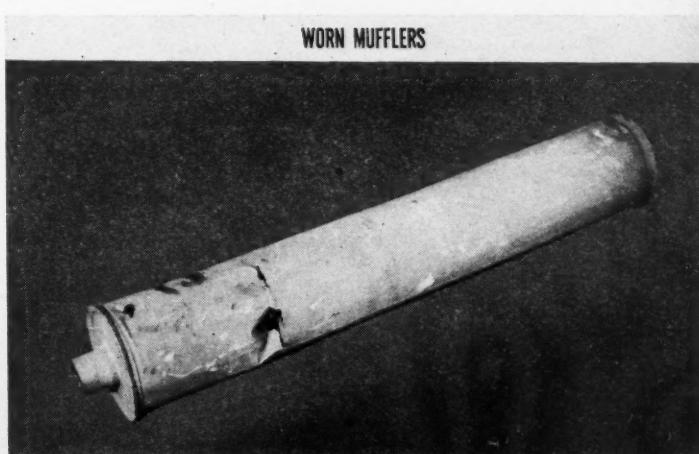
GREASE AND DIRT



OLD AND NEW REFLECTORS



WORN OUT WHEEL BEARINGS



WORN MUFFLERS

HE SELLS

# Major Overhauling.

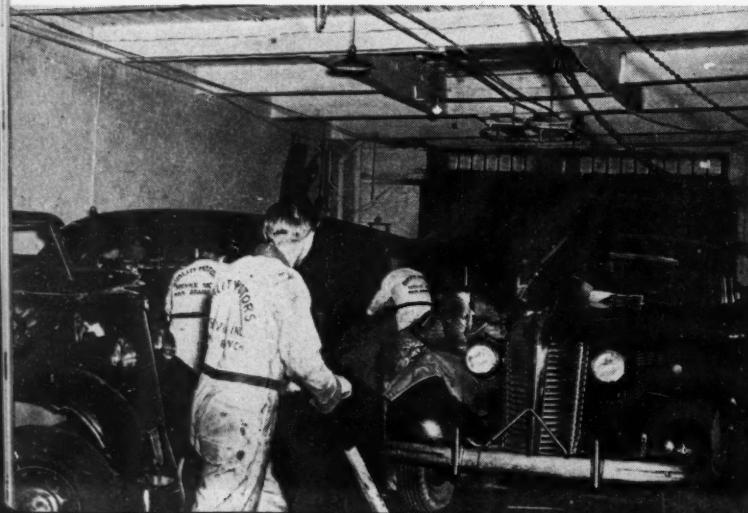
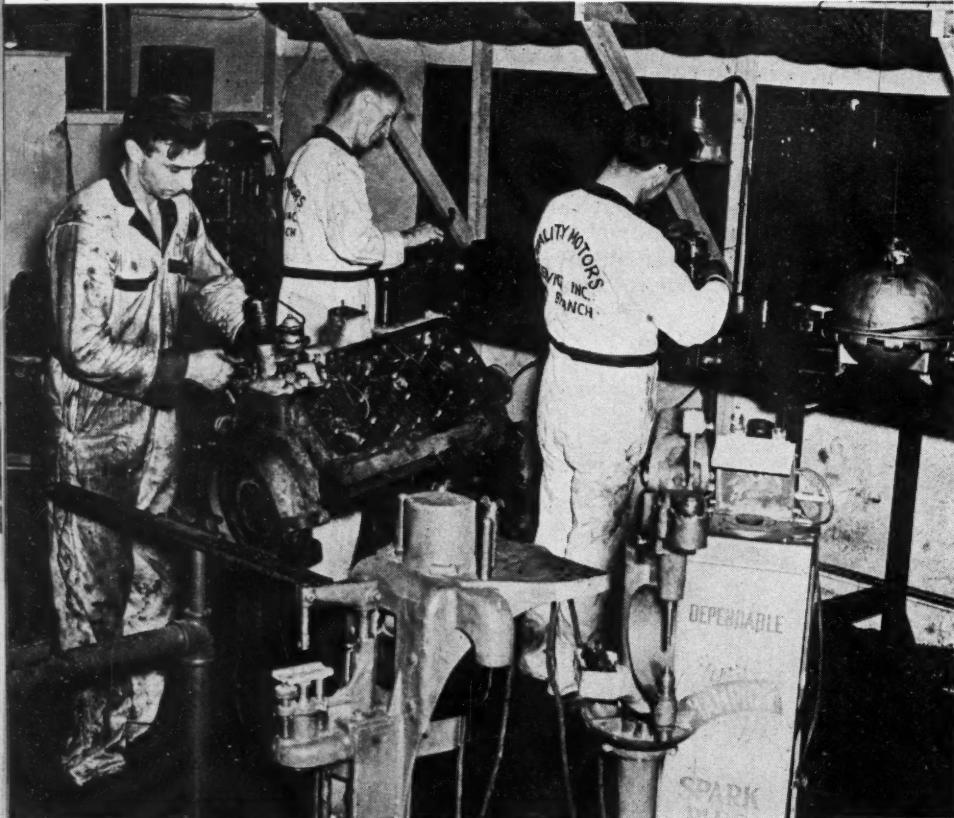
**Gus Comegys, Philadelphia repairman, has made "Repairs on Time"**

By VICTOR ZACHARY

LESS than two years ago, Gus Comegys left a service-manager's job with Wager and Karples, of Philadelphia, with nothing in his pockets . . . but he had an idea in his head. That idea was: automotive service on a credit plan. If other lines of business could make a success of the credit plan, why not automobile repairs?

Gus Comegys, as a service manager, saw too many customers walk out without having their cars sufficiently serviced; because they could not lay out the money for a complete job. It was the same story over and over. A customer would bring in an auto, have it gone over; was told what repairs were *necessary*, but when he heard the cost, he

These servicemen are busy because they sell service on a credit plan, designed to fill all the needs of the car owner. When a car comes in for service, it is checked over completely . . . the owner is told how much it will



# • • ON CREDIT

**Pay \$7000 a month.**



Gus Comegys, his credit plans sell service

stopped to take a mental stock of allowable expense in this connection. After a little mental arithmetic, the customer usually wound up with this remark, "O.K., put new brake linings on and fix the clutch. I'll have to take care of the other things when I have the money." Brake linings and clutch were attended to and that was the last the shop ever saw of that customer, and many more like him. Here, Gus reasoned, was *good* business going to the dogs. Here were repairs that were necessary, but not being done; and the customer drove his car out of the shop knowing that he has had nothing done to it. And here was a service-manager letting an automobile leave the shop not knowing how

long or how far this customer was going in it.

When Gus left his job, he went on foot, looking for a suitable spot to open a repair shop, and give birth to his idea. He found it, but he had no ready cash. He approached his landlord for a loan, which was granted after he had disclosed his plans, and ideas again. The sum borrowed was \$250.00. The next day he signed a lease, hired a crew, bought necessary tools and machinery. He personally painted the shop, lettered the windows, did the necessary carpenter work and repairs, and wired the electrical fixtures. And, he was also his own chief mechanic. All equipment for the shop was bought

on a 30, 60 or 90-day note. He felt confident that he could take care of these notes when they came due, from the business he would do in the interim. And he did. Even today, Gus, with a well-equipped shop, will always listen to someone who has something new that will help turn out a better repair job.

With a little advertising, business began coming in. In the space of a few weeks, his shop force was doubled. After that first week, Gus went home every Saturday night with his weekly drawing in his pocket, \$5.00. The rest stayed in the business.

The essential point in Gus Comegys's plan was to sell each customer  
(Continued on page 88)

cost to put the car in first class shape. Instead of buying maintenance in small doses or little makeshift jobs, the car owner buys a complete, bumper to bumper repair job, fully guaranteed, and easily financed. Financing

includes tires, tubes and accessories, as well as body and fender service, engine overhauling, frame straightening and wheel alignment. Nine mechanics, three body and fender repairmen, two painters, two porters, a

shop foreman and a bookkeeper are employed. Operating only twenty months this shop is now averaging \$7,000 monthly volume. It's a busy shop, all right, take a look at the follow-up service board shown below.



NAME	MAKE	YEAR	LICENSE	REPAIRS	PROM.	DISPOSITION
John Brown	Ford	1935	5746	Front End, Body, Paint	7-17-40	Resale
W. Morgan	Ford	1934	57482	Motor, Brakes, Etc.	7-20-40	
James Murphy	Chrysler	1936	9161	Motor, Body, Paint	7-20-40	
James O'Connell	Buick	1934	30487	Gasoline, Oil, Paint	7-20-40	
Ernest Selders	Ford	1937	65533	Motor, Body, Paint	7-20-40	
John Smith	Buick	1935	6534	Motor, Body, Paint	7-19-40	
John Stahl	Buick	1934	29126	Motor, Body, Paint	7-18-40	Resale
John Stevens	Ford	1934	30725	Gas, Body, Resale	7-18-40	Resale
John Stevens	Ford	1934	29433	Motor, Starter	7-19-40	
John Stevens	Ford	1933	57510	Motor, Body, Paint	7-21-40	
John Stevens	Ford	1935	64107	Gasoline, Body, Paint	7-21-40	
John Stevens	Ford	1934	41532	Motor, Starter	7-18-40	Resale
John Stevens	Ford	1934	30747	Motor, Body, Paint	7-20-40	
John Stevens	Ford	1934	30748	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30749	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30750	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30751	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30752	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30753	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30754	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30755	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30756	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30757	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30758	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30759	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30760	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30761	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30762	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30763	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30764	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30765	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30766	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30767	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30768	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30769	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30770	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30771	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30772	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30773	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30774	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30775	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30776	Front End, Body, Paint	7-22-40	
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John Stevens	Ford	1934	30783	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30784	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30785	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30786	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30787	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30788	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30789	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30790	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30791	Front End, Body, Paint	7-22-40	
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John Stevens	Ford	1934	30793	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30794	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30795	Front End, Body, Paint	7-22-40	
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John Stevens	Ford	1934	30804	Front End, Body, Paint	7-22-40	
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John Stevens	Ford	1934	30834	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30835	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30836	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30837	Front End, Body, Paint	7-22-40	
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John Stevens	Ford	1934	30841	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30842	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30843	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30844	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30845	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30846	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30847	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30848	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30849	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30850	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30851	Front End, Body, Paint	7-22-40	
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John Stevens	Ford	1934	30860	Front End, Body, Paint	7-22-40	
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John Stevens	Ford	1934	30862	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30863	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30864	Front End, Body, Paint	7-22-40	
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John Stevens	Ford	1934	30873	Front End, Body, Paint	7-22-40	
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John Stevens	Ford	1934	30876	Front End, Body, Paint	7-22-40	
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John Stevens	Ford	1934	30880	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30881	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30882	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30883	Front End, Body, Paint	7-22-40	
John Stevens	Ford	1934	30884	Front End, Body, Paint	7-22-40	
John Stevens						

# Service Hints FROM

## Carburetor Heat Baffle

A carburetor heat baffle which deflects heat to the carburetor on 1939 and 1940 Studebaker Champion models is now available for cars in service. The installation of this baffle will assist in preventing engine stalling due to frosting in the carburetor. If this condition does occur it does so only within a narrow range of temperatures (approximately 30 deg. to 40 deg. F.) and under conditions of high humidity.

This new baffle may be secured from the Parts and Accessories Division or any of its Parts Depots under Part No. 199847.

### To install the baffle:

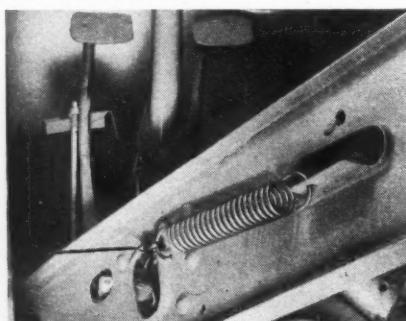
1. Place the forward slot under the second cylinder head screw on the carburetor side of the engine. Install flat washer between the cylinder head cap screw and the defectors.

2. Place the other slot at the second manifold stud.

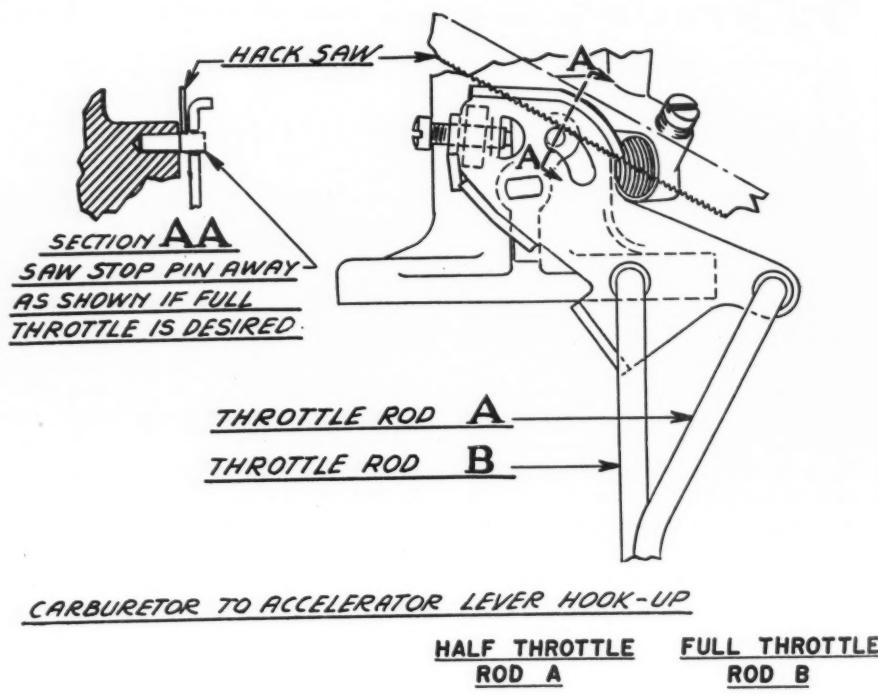
3. Place the hole in the baffle over the inside carburetor stud below the nut and lock washer.

## Lubrication

When lubricating the 1941 Pontiac, don't overlook the clutch pedal helper spring. This is the over-center spring which is located on the left leg of the frame X-member, and attaches to



the clutch pedal. Use a little viscous chassis lubricant on the spring where it attaches to the clutch pedal—otherwise a noise may develop at this point.



## Economy Change-Over

To change the 1940 Chevrolet engine to an economy model, the following parts should be installed:

Part No.	Name	No.	Req'd.
595852	Fleet car adj. plate	1	
476061	Fleet car iden. plate	1	
596366	Anti-freeze caution tag	1	
135956	Rivet (5/16 in. $\frac{1}{8}$ in.)	8	
595849	Manifold heat shield	1	
985128	Thermostat (160 deg. opening)	1	
838990	Carburetor ( $\frac{1}{2}$ throttle opening)	1	
838341	Water outlet gasket	1	
3654884	Half throttle rod (for use with governor)	1	
or			
3654878	Half throttle rod (for use without governor and with or without booster brake)	1	

3654885 Half throttle rod (for use with governor and booster brake) 1

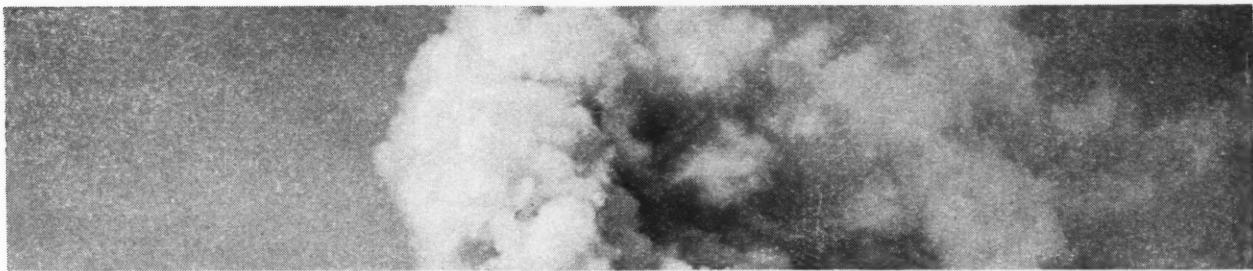
These parts can be purchased from the local Chevrolet dealer.

Illustration shows throttle rod hook-up as well as the change that may be made where full rather than half throttle is desired.

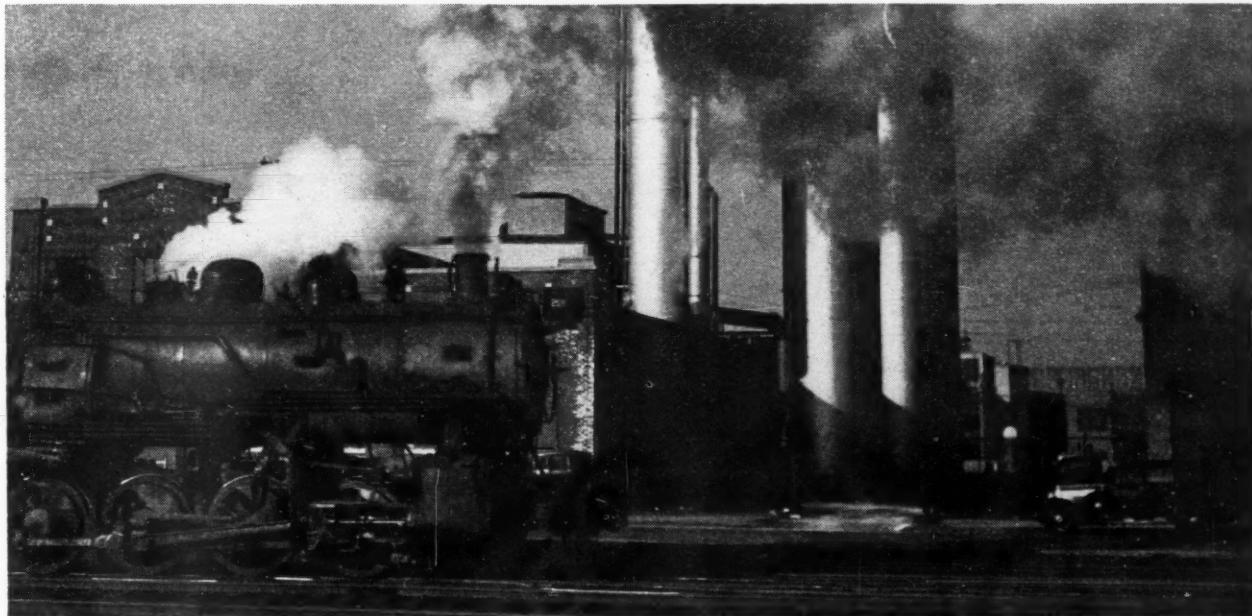
The engine should be tuned according to specifications with the exception that the valves should be set: Intake, .010 in.; Exhaust, .016 in.—both hot.

The transmission should be filled with S.A.E. 40 motor oil. Oil no heavier than S.A.E. 20 should be used in the engine.

When a regular production engine is changed to an economy engine, the adjustment and identification plates must be installed to properly identify the type of engine to anyone who may have occasion to perform maintenance work or add oil to the engine or trans-



## THE FACTORIES



mission. The fleet car adjustment instruction plate should be installed in the center of the right or ignition side of the valve rocker arm cover. The anti-freeze caution tag should be attached to the radiator filler neck. Permanent anti-freeze should be used in the cooling system.



### To Increase Operating Temperature

Some of the early 1940 model Plymouth engines operate at a temperature below 150 deg. F., making insufficient heat for the operation of the car heater.

To correct this condition, Chrysler has provided a new thermostat, Part No. 855862, and a new thermostat gasket, Part No. 363220. The installation of these parts will raise the engine operating temperature.

It is recommended that, whenever this new thermostat and gasket installation is made, a "XX" be cut with a file on the cylinder head outlet fitting so that other shops will know that this has been done.

### Odor from Climatizer

If the filter pack in the doors, climatizer or climatizer inlet on Studebaker cars are allowed to become water-soaked it may cause an objectionable odor in the car.

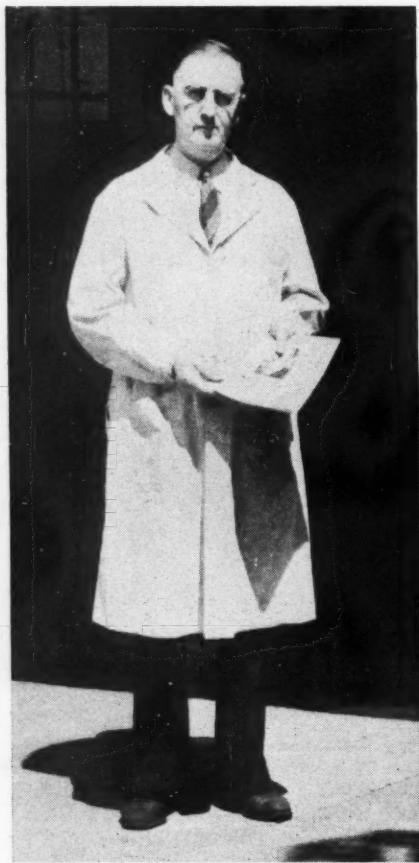
Should cases of this kind be experienced, it will be necessary to either replace the filter pack with a new one or:

1. Remove the filter pack.
2. Wash it in clean gasoline.
3. Blow dry with compressed air.
4. Saturate with clean oil, permitting excess oil to drain.
5. And then replace it.

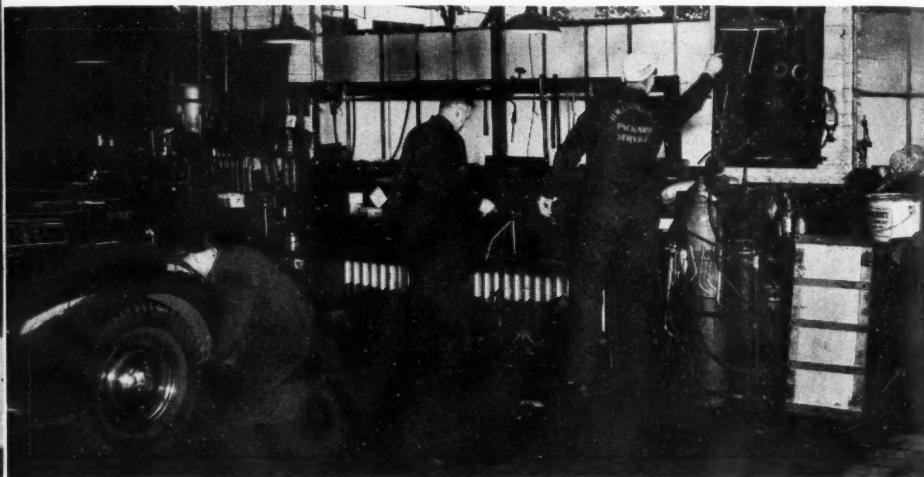
This condition will not occur if the climatizer is properly oiled and serviced.

### Low Speed Miss

One point to check when trying to locate a low-speed engine miss, or uneven operation of the 1940 Oldsmobile is loose fuel pump cover screws on both the fuel pump side and the vacuum pump side of the combination fuel and vacuum pump unit. Loose cover attaching screws will cause a vacuum leak and result in a low-speed miss or uneven operation of the engine.



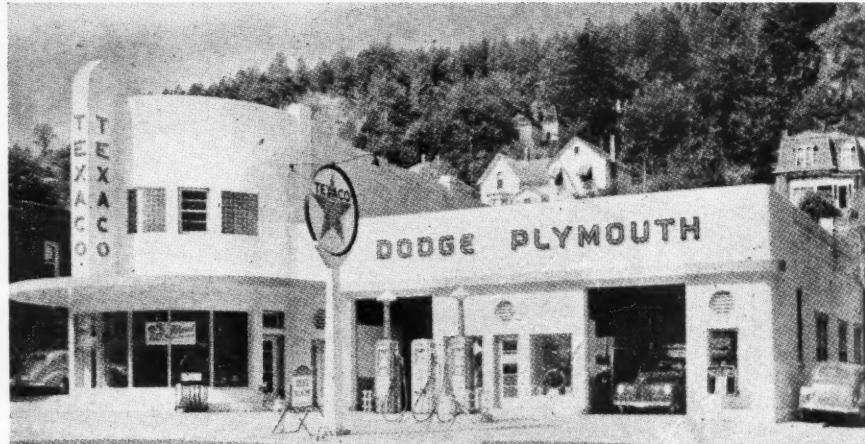
## MOTOR AGE SHOP OF THE MONTH



**H. W. Lighthall** (above) runs a busy shop in Buffalo, N. Y. Employs five mechanics handling about 300 shop orders a month. His annual volume of business is in the neighborhood of \$30,000. Gasoline merchandising doesn't figure into this set-up. But, he has a well-equipped shop (above right) with \$5,000 invested in equipment.

**Super service in South Dakota** is the title of this picture (right). It's Murray Bros. Inc. modern maintenance set-up at Deadwood, S. D. Four mechanics are employed and annual volume of business is \$12,000.

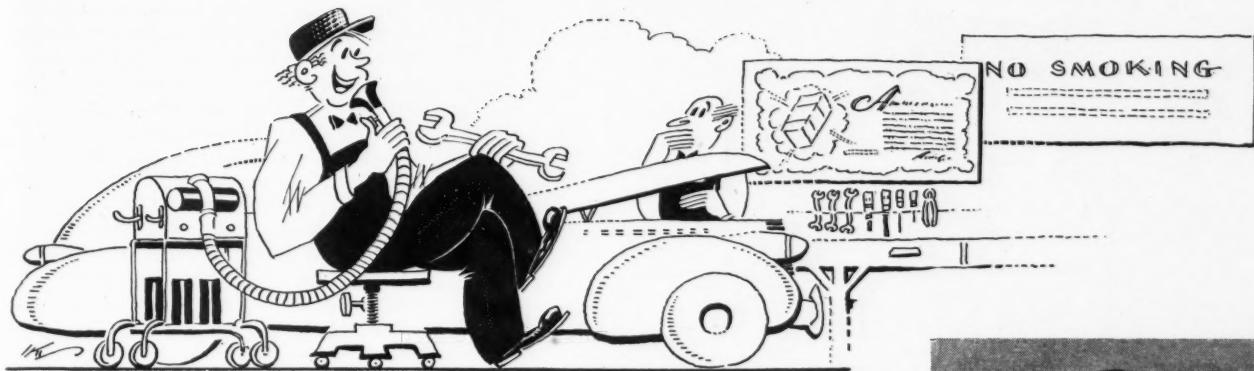
**Big jobs from the gas pump** is the secret at Hardenbrook's Garage, Piqua, O. (below). Operated by Clyde and Theodore Hardenbrook, this shop



does an annual volume in the neighborhood of \$60,000. Shop orders average about 500 a month. This shop specializes in body work and heavy over-

hauling but they use the gas pump out front as a magnet for business. Six mechanics are employed here. Note the wrecker in the picture below.





THE READERS'

# CLEARING HOUSE

## of Servicemen's Queries

### GEAR SHIFT RATTLES

*I have a 1939 Buick 40 Series that has trouble with the steering column gear shift being noisy. Please send me some information as to the cause and remedy.—Bill Bishop, Morris, Ill.*

THERE are two major places in this mechanism at which noise is produced—at the gear shift lever itself under the steering wheel, and at the lower end of the steering column between the shift control shaft and the steering column.

To correct the noise at the lower end of the steering column you can obtain anti-rattle springs from your nearest Buick dealer under part number 1310960, group number 4.017. This anti-rattle spring or clip is installed between the control shaft and the steering column and will eliminate the noise at this point.

The noise at the gear shift lever occurs at two points—at the lever pivot pin, and between the end of the control shaft and the lever. You can install fibre washers on the pivot pin to make it fit tighter and eliminate



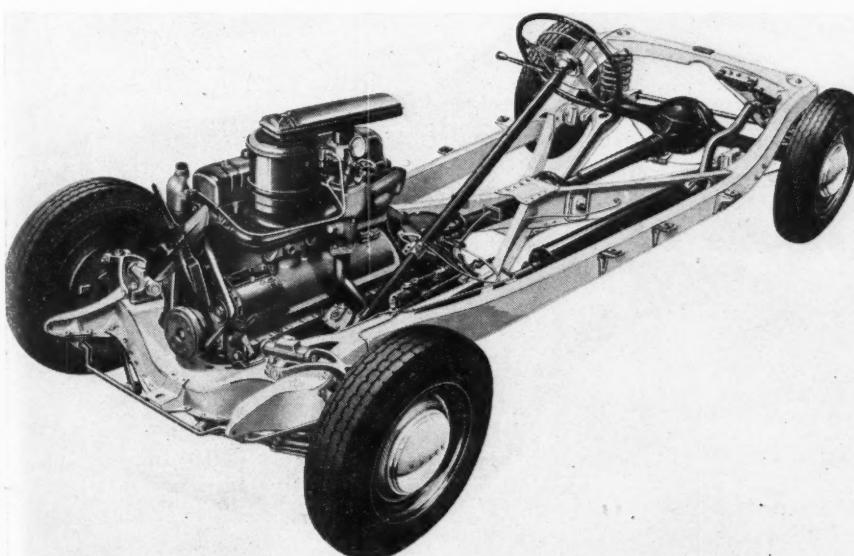
Bill Toboldt, Editor, Motor Age

the rattle there. You can obtain shims from your Buick dealer and install them between the end of the control shaft and the shift lever to eliminate this rattle. These shims are supplied in thicknesses of .005 in. and .010 in. The .005 in. shim is part number 1311209, and the .010 in. shim is number 1311210.

### MECHANIC'S PLAINT

In my tool cabinet over the bench I have a couple dozen oil companies' charts. But I won't bring them out, I shall just set down the problems as they have popped up since 1932. Previous to that time we mostly had light, medium, and heavy, sometimes extra heavy, grades of motor oils. It was nothing in those days to put 40 or 50 viscosity oil in a motor that was brand new.

But in the neighborhood of 1932, at least in our vicinity, weights of oils took on a new significance. Somebody sold us a barrel of S.A.E. 10. We were pretty much of the opinion it would have the same effect on a motor as a fill of straight kerosine. But we decided to experiment, and were square about it and put it in our own cars, before putting it in the customer's cars. To our surprise it seemed to do as well as the heavier grades. So we started using No. 10 oil in the motors until they started using it excessively, then moved up to No. 20, then No. 30, and so on.





"It's the only way we can get her started!"

That little stunt was against car factory recommendations even at that time, but a few of the oil companies backed us up in it. And we found out that a new car that had started out using No. 10 oil would "hold" it swell. Sometimes it would stay in up until 20,000, and sometimes on up to 50,000 miles. But a car that had started out on say No. 30 oil, wouldn't hold a No. 10 if it were added later, even at lower mileages. So we came to a conclusion, namely: The lighter oils were of less body and would lubricate the closer clearances without causing the necessary wearing away of material in the motor to allow for its passage. Based on that theory we told hun-

dreds of customers that light oil was in comparison to heavy oil as tissue paper is to cardboard, and to lessen wear, by all means use the light oil as long as the new car would hold it. This, mind you, was against the factory recommendation, but the oil men (some of them) backed us up. We justified the factory's stand for the heavier oil by the fact that different grades of oils were encountered in the field, and as a cheap oil, or poorly refined oil wouldn't stand up in the lighter grades, they had to generalize in their suggested weights to cover all brands, and stay on the safe side. But we stayed sold on the light oil in the better brands with no trouble.

One make of car threw a scare in us, however, in 1934 or thereabouts. Due to an engineering error in judgment, there were a series of piston seizures. While searching for its cause in the field the factory representatives pounced on the light oil we were using, and pointed the finger at our midriff, telling us we had certainly bought something we couldn't eat in going contrary to their instructions. But fortunately for us other dealers in the same city had followed their instructions and also had seizures in even greater numbers, so that blew over, and they found the real cause to lie with their engineers.

During that trouble we gathered certain information on oil make-up from various sources.

That brightstock wouldn't form sludge.

That brightstock was the lubricating substance.

That brightstock was just a filler to raise the weight.

That brightstock would dissipate heat.

That brightstock would retain heat.

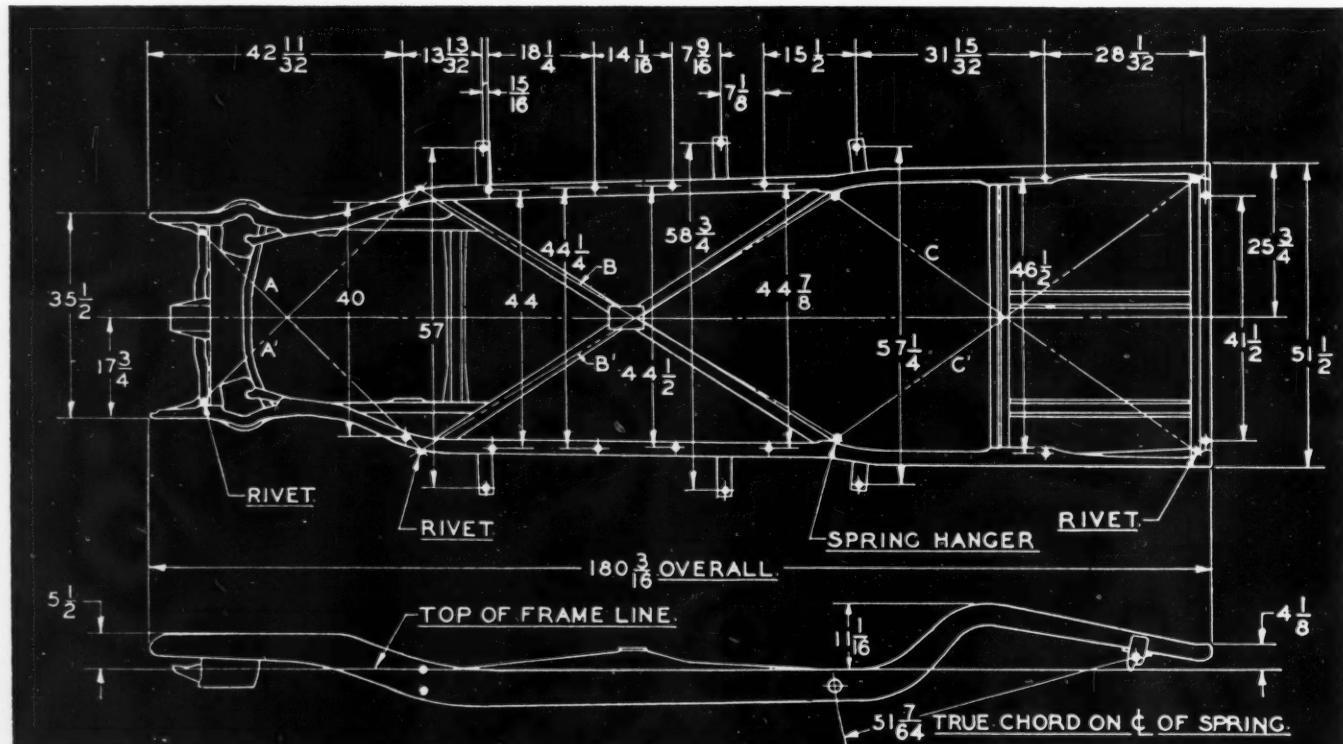
That brightstock would cushion shock to reciprocating parts, such as connecting rod bearings, etc., etc., etc.

All this information wasn't volunteered. We gathered it from the oil men and automobile service representatives as we went along.

Not long ago in another make of car a certain amount of bearing trouble was encountered when the car was run at extreme high speeds for long periods of time.

The bearings would be crumbled rather than burned and discolored

Frame diagram, Pontiac Custom Torpedo and Streamline Torpedo 6 and 8



as in the case of poor lubrication. The factory service man was called in this case, as in the other. And the finger was pointed again. We admitted that we had recommended a No. 10 oil, and the man had a pan full of powdered bearings, so our recommendation was the cause, the factory man told us. In the older cars we had got along pretty well with the light stuff, he explained, because the high heat and heavy bearing loads encountered on the new stuff wasn't found in the old car. Again it looked like we had talked when we should have been listening.

But once more someone came to our rescue. The owner had not liked the idea of taking our suggestion against that of the factory recommendation in his manual, so he hadn't followed our light oil suggestion, and could prove it by his oil company receipts. He had used No. 30 from the beginning. The factory man said it must need a No. 40 then.

Later we read where bearings lose almost 90 per cent of their strength as motor heat runs up from 70 degrees to 270 deg. Fahr. So it seemed to us that the cooling of the bearings by the oil was as important as the cushioning they received by the oil. But we can't be sure which weight of oil is the best cooling agent, the heavy or the light.

Why don't we just follow the factory recommendation? Because they haven't always been right previously, nor does their information always follow the same line as the various oil engineers! And we would like to know the reason "why."

And it does seem a lot more dealer shop confidence could be built up if the factories weren't so jealous of their secrets and would take down their hair and give us the actual sequence of their different experiments and reason for their conclusions.

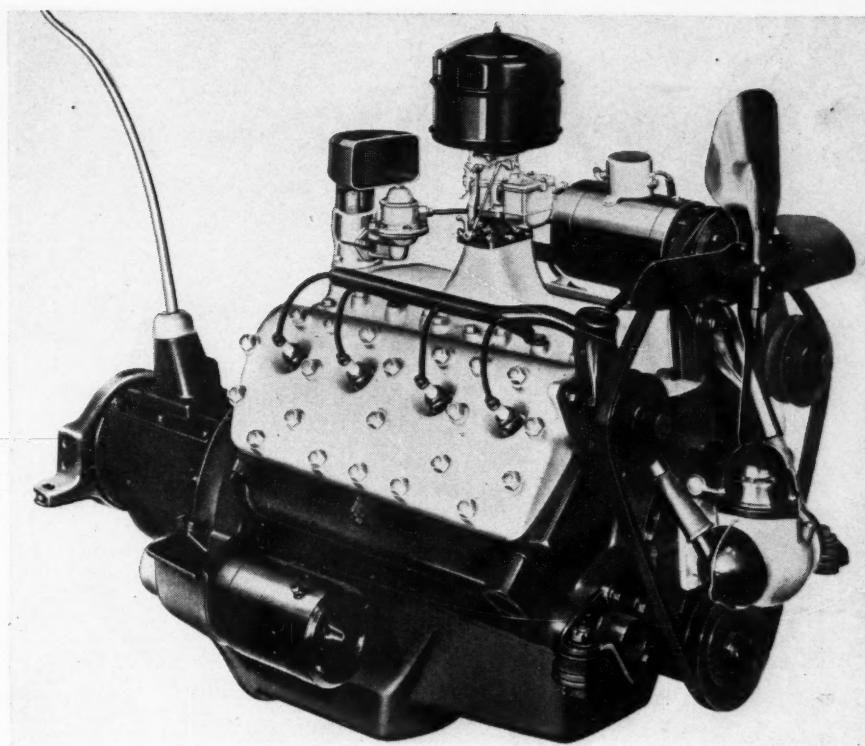
After all, the mechanics in the field turn in a lot of service information that help the factory men, so why don't they reciprocate?

New Mexico Reader.

## INCREASING COMPRESSION

I have a customer who wants me to increase the compression ratio of his 1936 Ford V-8 engine. Can you give me full details and specifications for planing off the heads, and should I change the timing, valve lift, etc.—Harry Ward, Mt. Shasta, Cal.

THE present ratio is 6.3 to 1; this can be increased to 7 to 1 by planing off .075 in. of the heads. You will have to watch the clearance of the valves in the combustion chamber to be sure that they do not hit the head in the wide-open position, but it should not be necessary for you to change the valve lift. You should retard the ignition timing to 2 deg. before top center instead of 4 deg. which is the present setting.



## NEED TWO OF A KIND

I recently tuned up a 1935 Ford V-8 engine, after which the owner got a little better than 17 miles per gallon. Since then the car has been driven 400 miles, and now the car is delivering only about 13-14 miles per gallon.

During this period of 400 miles, the aluminum cylinder head cracked and the owner bought a cast iron head to replace it.

Do you think the cast iron head has something to do with the drop off of mileage per gallon?—W. R. McMan, New York City.

IT is entirely possible that the installation of the cast iron head in place of the aluminum cylinder head reduced the fuel economy of your customer's Ford V-8. You could undoubtedly improve this mileage by retiming the distributor. However, if he installed only one cast iron head, which you imply in your letter, I am inclined to believe that it would be very difficult to get satisfactory performance under those conditions. If he is using one cast iron head and one aluminum head, I would suggest that you advise him to change so he uses the same type of head on both banks of the engine, and then tune the engine and pay particular attention to the distributor advance.

## HIGH SPEED SPARK KNOCK

We have a 1937 Plymouth that develops a ping at 50 m.p.h., but performs fine up to that point. The distributor has been checked, and timed with a timing light. The customer uses premium grade gasoline.

We have a 1940 Buick Special which performs in the same manner.

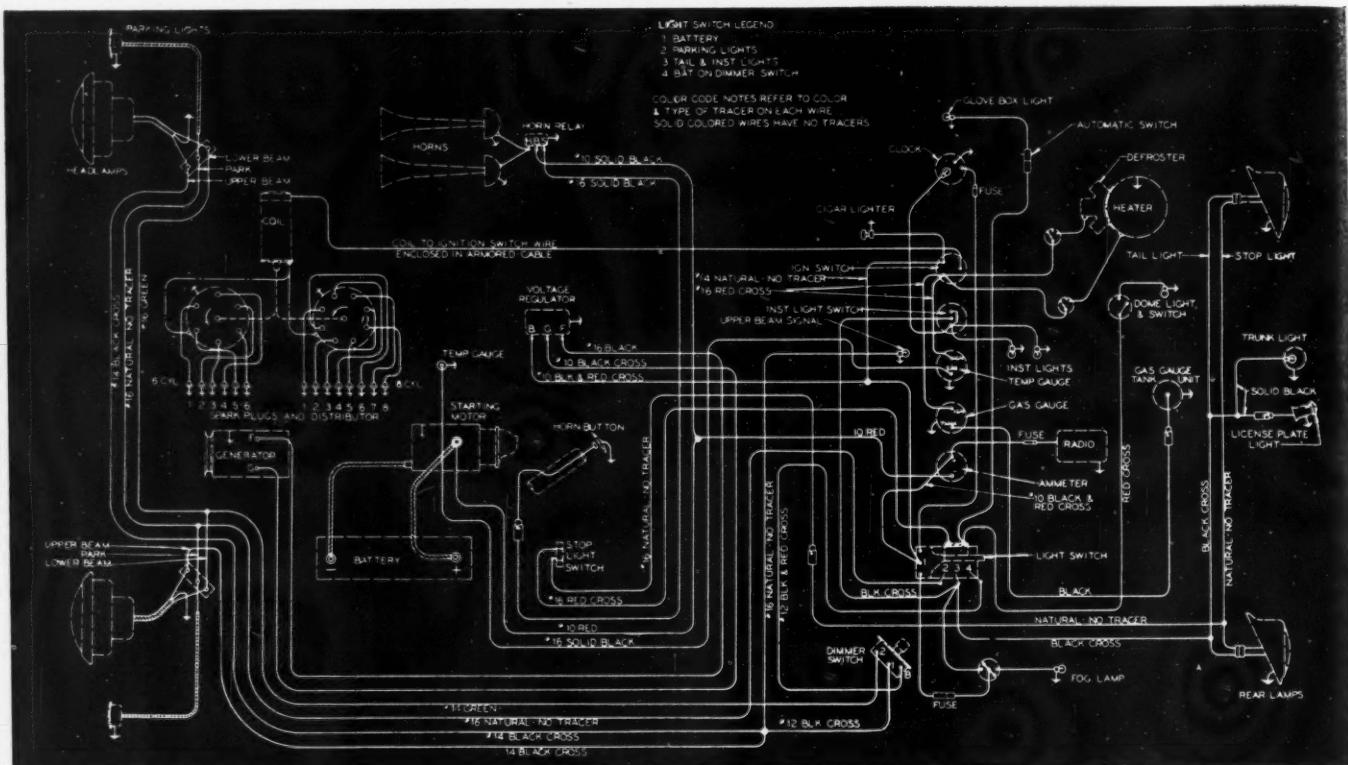
Some of our Chevrolets, when accelerating a little fast, pop back through the carburetor.

Please give us the solutions to these problems. — Arthur Volzka, Racine, Wisconsin.

ON both your 1937 Plymouth and your 1940 Buick which develop a ping at higher engine speeds, I would suggest that you make a careful check of the distributor automatic advance. I note that you say the distributor was checked but it is not clear in my mind as to whether or not you



"Come, come—stop gaping and give me some aviation gas!"



**Wiring diagram, Oldsmobile 1940 models**

checked the automatic advance to make sure that it is not advancing too rapidly at higher speeds. In this connection, you should not only check the centrifugal advance in the distributor, but also the vacuum advance.

Another point to check is the distributor cam itself. In many cases you will find that the cam is not true with the result that some cylinders are out of time. A careful selection of a new cam should overcome this trouble.

As a further point, the trouble might be caused by a lean mixture resulting from a clogged high speed jet or a jet that is too small.

On your Chevrolet that is popping back through the carburetor, the trouble is probably caused by the incorrect adjustment of the metering rod. The only way to adjust these is with the metering rod gage which can be secured from any Carter carburetor distributor. Another point to check would be for intake manifold leaks and worn intake valve guides.

### WORN PISTON

I installed a master cylinder cup in a 1938 Plymouth. The job came back within two months with the back of the piston considerably scored and cut.

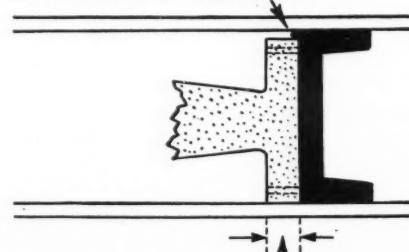
I installed another one which came back in less time than the first one.

The cylinder was then slightly polished (it seemed very smooth). All new parts were installed. The job has been out for quite a few months with no indication of any difficulty. The reason I only installed a cup the first

two times was because all the other parts seemed to be perfect.

I would appreciate your advice as to what you think was wrong with this job and what caused these two cups to go the way they did. New Jersey subscriber.

### CUP PINCHES IN THIS SPACE IF CLEARANCE IS EXCESSIVE



**NARROW BEARING SURFACE OF PISTON ACCOUNTS FOR FAST WEAR**

YOU undoubtedly must have had a worn piston which permitted too much clearance between the piston and the cylinder wall. Undue clearance at this point will cause the rubber of the cup to be squeezed in that space under pressure and chew it up.

You should have installed a new piston the first time and undoubtedly would have avoided this difficulty.

It is good practice at all times, especially after a car has gone 15,000 to 20,000 miles, when master cylinder work is necessary, to replace the piston, both to remedy the above condition as well as to be sure that a proper seal is obtained at the secondary cup on the other end of the piston.

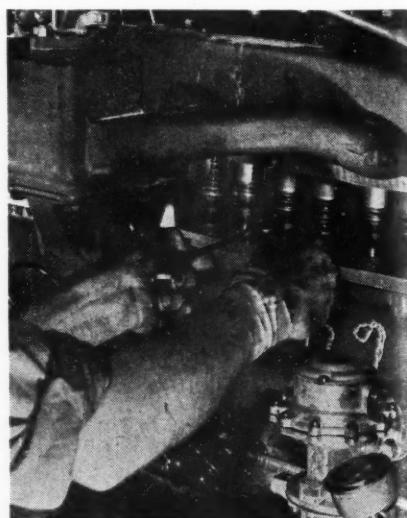
Should it be necessary to hone the cylinder, use oversize pistons.

### HOT OR COLD?

We small town garages are up against a proposition that is pretty expensive to lick. Most car manufacturers advise setting the valve lash with the engine Hot and running. We are not in a position to do this as we can't afford the special tools necessary for the different models.

Isn't there a medium that we could use while the engine is cold?—Bert Jordan, South Side Garage, Springville, Iowa.

THERE is no standard conversion figure that can be used to convert Hot clearance to Cold clearance because valve stems are not all the same length or made of the same material. However, most mechanics add .001 in. to the Hot clearance when setting valve cold, and it seems to work out.



all right. Some add .002 in. to be on the safe side, but generally speaking I think .001 in. is sufficient.

## TOO RICH

*I am having a little trouble with a 1929 Chevrolet car. It rolls or gallops as if it were getting too much gas, but no adjustment on the carburetor will make it run any differently. If you shut off the needle, it will stall the engine. It does this so badly that if you slow down the engine to idle speed it will stop, but it would not stop if it were not for this gallop. There are no air leaks.*

*I would like to have you give me all the possibilities you can think of.*

*A Nebraska Subscriber.*

**JUDGING** from your description, I am of the opinion that the difficulty can be traced directly to the carburetor.

My first guess is that the idle tube in the carburetor is plugged. Quite often simply removing this tube and cleaning it out will overcome this trouble. There is also the possibility that the air hole in the body of the carburetor at the idle adjusting screw is plugged. Be sure that this is clean first, before you remove the idle tube.

If these two points do not relieve the condition, file a flat on the point of the idle adjusting screw where it uncovers the idle air hole in the body of the carburetor. This will admit more air, and tend to lean out the mixture.

## SPARK PLUG FAILURE

*I have a 1934 Chevrolet Standard, and I cannot keep spark plugs in it. Have used several different makes, but one after another they go bad, and not in any particular cylinder. The engine delivers about 700 miles to a quart of oil and about 18 to 20 miles to a gallon of gasoline.*

*I installed a new coil which helped some, and when the wire is held away from the plug the spark will jump about  $\frac{1}{2}$  in. Plugs are set at .032 in. gap.—N. Hickey, Los Angeles, Cal.*

**I** NOTE you have tried several different makes of spark plugs, but you do not state that you have tried plugs having different heat ranges. Quite possibly a colder running plug would overcome your trouble. As another suggestion, if the carburetor is adjusted too lean it will tend to make the plugs fail. I would suggest that you first check over the carburetor and make sure that is it okey, and secondly that you try a cooler running plug.

## DISTRIBUTOR DRIVE CONNECTION BREAKS

*I have a 1936 Buick which is constantly breaking the distributor drive connection between the oil pump and the distributor shaft. New parts last between 2000 and 2500 miles. The*



"Hey, Bud—no swimmin' here!"

*shaft seems to be in line, and turns without binding, and the distributor turns freely. I believe this part is too hard and brittle. Any advice on this subject will be appreciated.—F. A. Ozepeck, Little Rock, Washington.*

**O**N that 1936 Buick which breaks the distributor drive connection, there is a possibility that the distributor shaft bushing has become worn, resulting in a misalignment condition or the distributor drive shaft may be sprung, or the oil pump housing worn so as to permit misalignment. Another point that comes to my mind is the condition of the oil. If the oil is

excessively heavy or dirty it would result in an excessive load on the distributor shaft connecting link, which in turn would cause it to break.

I think the best solution for this would be to install a new distributor shaft bushing, distributor shaft and new oil pump.

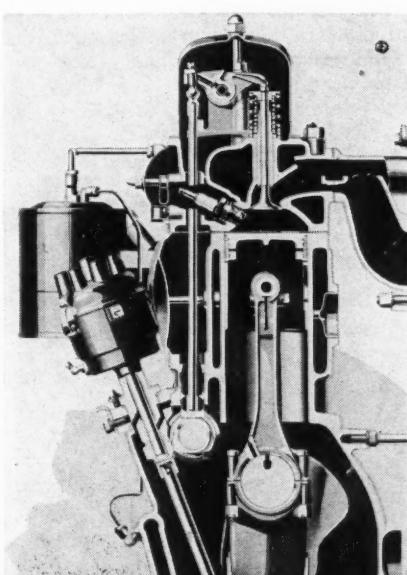
## CARBURETOR FLOODS

*About a month ago I overhauled a 1930 Chrysler. I delivered the car one afternoon and that night the fuel pump went bad, so I installed a new one. Since that time I have had plenty of trouble. The carburetor continues to flood. I have overhauled the carburetor, installed new pump leather, pump check valves, new float and float pin. Today I reduced the fuel pump pressure to a little less than 3 lbs.*

*Before the new pump was installed this trouble did not exist. Could it be the pump pressure? What pressure should this job have?—C. E. Ross, Hagerstown, Md.*

**Y**OU are on the right track in reducing the fuel pump pressure. This pressure should be between 2 and 4 lbs., and since you have reduced it to a little less than 3 lbs. I believe the job will be O. K.

There is the possibility, of course, that the new float needle valve and seat you installed is not good in that the needle may not have a gas-tight seat. I would check this to be sure, and also check the float level to be sure it is not too high.



# Shop Kinks

\$3



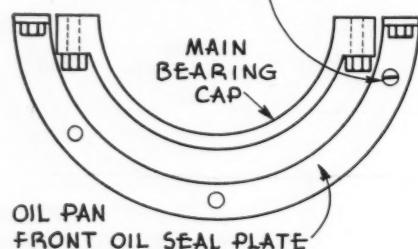
Here's your chance to pick up a little cigarette money. We'll pay three bucks (\$3.00) for every Shop Kink accepted and printed. So send 'em in to us—some short cut you use in doing a job easier and quicker than the other fellow—some special tool you made when you couldn't buy one to do the job—and we'll do the rest.

Here are some that were accepted this month:

## FRONT MAIN BEARING

The Plymouth front main bearing cap cannot readily be removed because of the oil pan front end oil seal plate which is bolted to the engine front support plate. This oil seal plate is semi-circular in shape, and bolts to the engine front support plate directly underneath the front main bearing cap. Its purpose is to form a seal between the oil pan front oil seal and the cylinder block.

### CUT SCREW DRIVER SLOT IN END OF MACHINE SCREW



The oil seal plate is held in place by five bolts. Four of these can be removed easily, but the fifth is a slotted-head machine screw installed from the front face of the support plate toward the back of the engine, passing through the support plate and the oil seal plate. This places the head of the screw inside the timing chain compartment where it cannot be reached with a screw driver except by removing the timing chain cover.

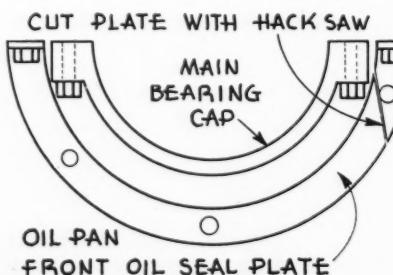
There are two general methods of removing the oil pan front end oil seal plate without removing the timing chain cover. One method is to first remove the four bolts that are easy to reach, and then to cut a screw driver slot in the end of the machine

screw (the head of which is concealed in the timing chain compartment). Then back the screw out and let it fall down in the bottom of the timing chain cover. Then the plate can be removed.

When the job is finished and the oil seal plate is ready to be reinstalled, first the machine screw which is now in the bottom of the timing chain cover has to be removed. This can be done easily by reaching up into the compartment either with the fingers or a piece of wire, and hooking out the screw. Then insert a piece of wire or a string through the hole in the support plate and tie end to a 5/16 in. cap screw. Install the oil seal plate by replacing the four bolts and then draw the cap screw up through the hole with the string. Tighten the cap screw in place with a lock washer and nut and the oil seal plate is held securely in place.

This method of removal was submitted by: A. J. Allen Auto Repair, 8102 American Ave., Detroit, Mich.

Another method which is accepted as being equally as good and perhaps a little quicker follows the same procedure up to the point of removing the concealed machine screw. This



method does not call for actually removing this screw; instead, a hacksaw is used to cut the oil seal plate as shown in the illustration. This leaves the upper right-hand end of the oil seal plate fastened in place, and permits removal of the balance of the plate. When the plate is reinstalled, either a piece of cork gasket or some sealing compound is used to plug the slot made by the hacksaw so as to prevent a leak at this point.

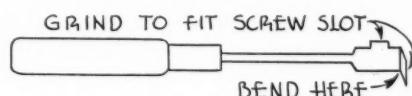
This method is advocated by: Leo Sherman, Clark Motor Co., State St., Clarks Summit, Pa.

## REMOVING KING PINS

Because the king pins used in the Ford car have to be driven upward in removing, it is sometimes difficult to get them out because they are often frozen. I use a  $\frac{3}{8}$  in. bolt about 3 in. long, with a nut run about 1 in. on the bolt. Place this in the hollow king pin with the nut acting as a shoulder against the king pin. Put a hydraulic jack under the head of the bolt and jack it up. When the weight of the car is resting on this bolt, hit the top of the axle a sharp blow with a heavy hammer and the king bolt will be driven out.—William C. Acker, San Francisco, Cal.

## ADJUSTING STEERING GEAR

Some steering parts are set so close to the engine or some other part that it is hard to get a screw driver on the sector shaft adjusting screw to make an adjustment.



I made a tool to do this job. It is made from an old screw driver as shown in the accompanying sketch, and does the job easily.—Roy Dahl, 112 4th Street, Fargo, N. D.



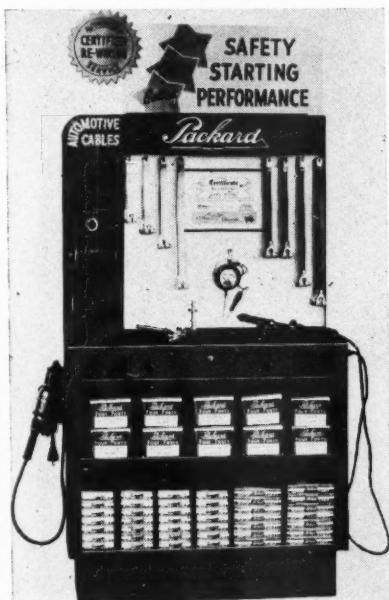
"Wassamatter?—don't you allow smoking on the job?"

# PROFIT MAKERS

PARTS • EQUIPMENT • TOOLS • ACCESSORIES

## Re-Wiring Department

The Packard Electric Division of General Motors, Warren, Ohio, has developed a complete Certified Re-Wiring Department in a single unit. The display work bench contains a



place for all necessary cables and tools, and provides a well-lighted bench for electrical repair work. The metal drawer has 14 terminal compartments with adjustable dividers, and affords safe-keeping for tools when not in use.

## Miniature Spark Plugs

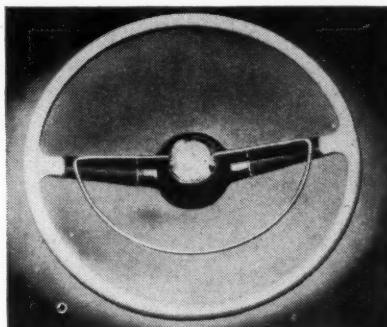
The unusually high speeds at which miniature high speed 2-cycle engines operate makes necessary a special spark plug, according to Motor Master Products Corp., 4757 Ravenswood Avenue, Chicago, Ill. Accordingly, they have developed and added to their line of Blue Crown spark plugs a miniature plug designed for service in these little engines for model use. The shells of these new plugs have a Plano-radial seat and a special packing gland to insure gas tightness. Poranite insulators are



used, and the electrodes are made of catalyzed nickel-manganese wire. For complete information and prices, write J. E. Menaugh Co., 549 Washington Blvd., Chicago, Ill.

## Horn Ring for Ford Cars

A new horn ring for installation without tools on the new Ford, Mercury and Lincoln-Zephyr cars has been announced by Peters and Russell, Inc., Springfield, Ohio. The new ring forms a semi-circle inside the lower half of the steering wheel, presenting no obstruction to vision. The connection to the center button lies flat along the two-spoke wheel. All the metal parts are chrome plated. Horn button replaces the original button, maker says, with no extra bolts, wires or other parts to adjust.

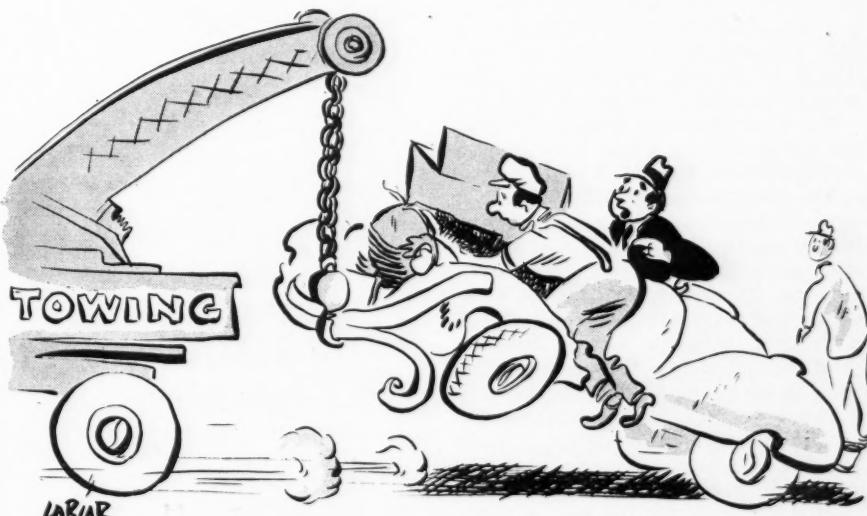


## Rust Master Has New Sludge Solvent

Rust Master Chemical Corp., 712 Beacon Street, Boston, Mass., has announced a new solvent for internal



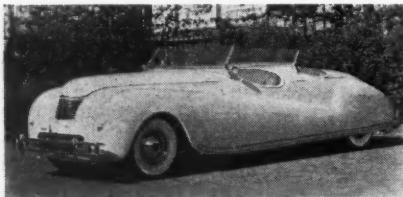
engine cleaning known as Six Master. This product is added to the oil in the crankcase, and it is claimed that it will clean sludge from pistons, cylinder walls, piston rings, valves and valve guides. The manufacturer suggests that a simple method of demonstrating this product is to smear some of the sludge on a piece of glass and then drop a few drops of Six Master on the sludge, as shown in the accompanying illustration.



# NEWS

## Race Car Design Influences Creators of "Future Cars" Featured at Shows

Amid the several hundred glistening 1941 motor cars that graced Grand Central Palace last month at the forty-first annual National Automobile Show in New York City were three cars of distinctive design and radical appearance. Although not made for the common purse—one was reportedly priced at \$8,300—these cars attracted more than their share of spectators because of their startlingly different body design and the fact that they may portend the motor car of tomorrow.



Chrysler Newport

Two of these cars were exhibited by Chrysler, a pale blue convertible roadster called the "Thunderbolt," and a phaeton in canary yellow called the "Newport." The third car was the experimental Buick conceived by Harley Earl, General Motors stylist, and first shown in Detroit last spring. This marked its New York debut, however.

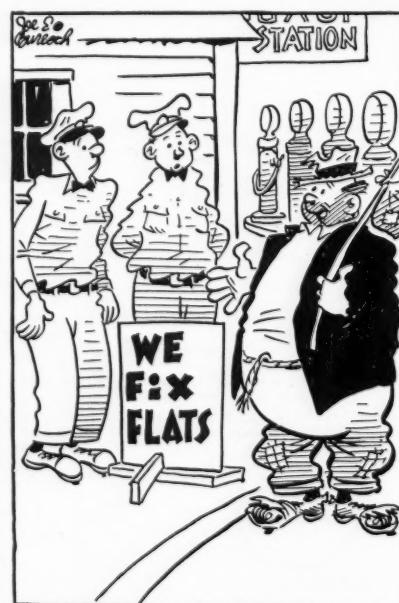
The two Chryslers were on display for the first time, along with another "Thunderbolt" exhibited concurrently at the Detroit show. In them Chrysler Corp. engineers see a forecast of future motor car styling and a new milepost in the history of aerodynamics and "fashioned-by-function" design. Both cars are the result of collaboration between Ralph Roberts, chief designer for LeBaron, custom body builder, and Chrysler engineers.

The development of racing cars had a large influence on the design of these vehicles. Chrysler engineers have followed the progress of record-setting machines closely for the last 15 years and have learned from them the importance of body design in increasing

speed, roadability and handling ease. These practical demonstrations, plus the most exhaustive studies of aerodynamics in the wind tunnel and elsewhere, conducted by Carl Breer, Chrysler executive engineer, and his associates resulted in the creation of the Chrysler Airflow car in 1934. This car was the first to present true functional design and its influence on all motor car design has been great.

In the two display cars, the low broad hood cuts down frontal resistance and the smooth-swept surfaces of front and rear, the flush glass and windshield and the absence of running boards reduce turbulence. Chrome is used only to give emphasis to functional lines and there is an entire absence of "gimcracks" and gingerbread work. Broadness of beam in these cars means greater interior roominess.

A unique feature of the "Thunderbolt," which was named after Captain George Eyston's English record-breaker (Continued on page 94)



"All right, boys, fix me, I'm flat!"



**SUPER ROAD** Here's an eagle's-eye view of Pennsylvania's new super highway, stretching between Pittsburgh and Harrisburg. 160 miles in length, the modern highway pierces the Appalachian Mts. with seven tunnels.



**TEST RUN** Army engineers have tested this 80-in. w.b., 40 horsepower midget truck. Equipped with a four-wheel drive and oversized tires, the little truck is shown here coming down a 65 degree grade.

### Left-Foot Brakes

On the 1941 cars equipped with automatic transmission or with fluid couplings, some engineers favor left-foot brake operation in the interest of better activity in heavy traffic. Although this implies a change\* in driving habits, it's not serious, and as a matter of fact it fits into the habit changes that normally come with the operation of such cars.

When you get behind the wheel of one of these cars, you find that left-foot braking comes easily. It speeds up the performance since the right foot remains on the accelerator pedal ready to push down at the change of lights.

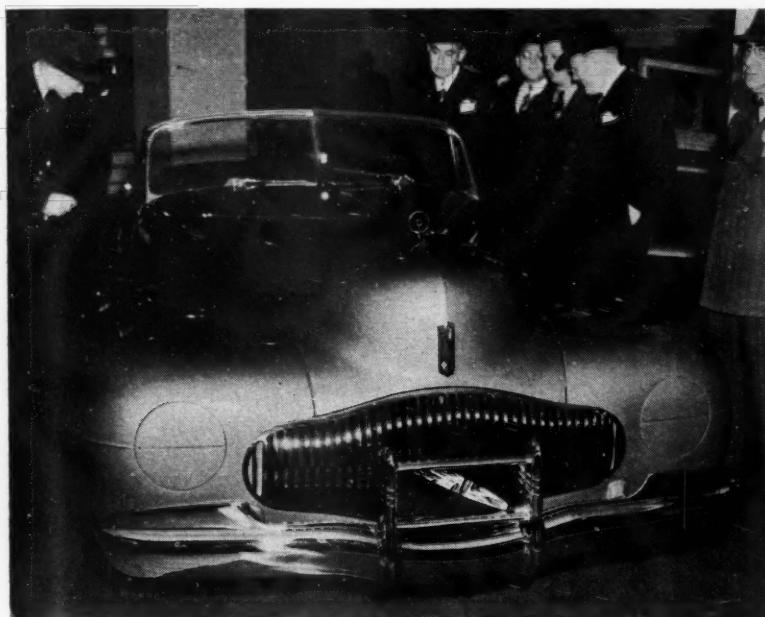


**FOUR CHAMPS** 1940 speed kings are Wilbur Shaw, victor at Indianapolis; Rex Mays, who added his Indianapolis second placer to his national dirt track victories and became AAA National Champion; Ab Jenkins, who drove his Marmon Meteor III for 24 hours at an average speed of 161.18, and Al Rogers, winner in the Pike's Peak hill climb.

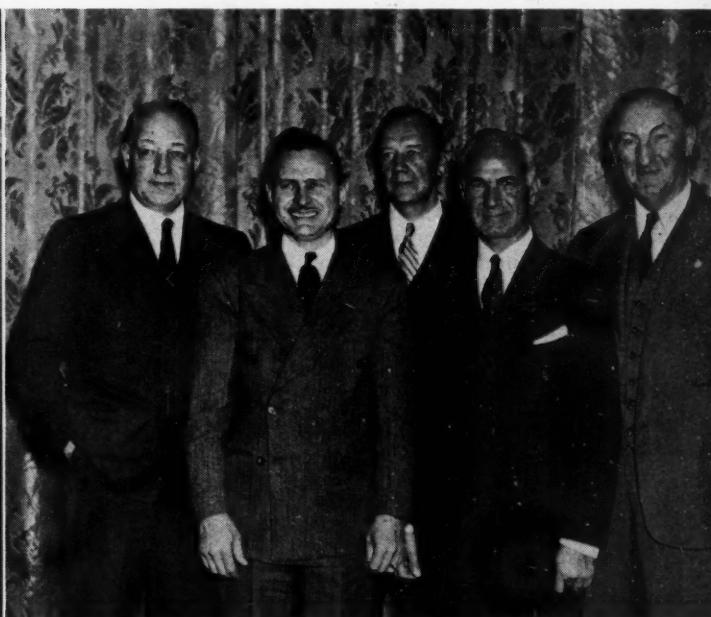
*Photo, Courtesy Firestone News Bureau*



**CHRYSLER THUNDERBOLT** Attraction at the N. Y. Show included this swanky pale blue convertible roadster and a phaeton in canary yellow called the Newport. Thunderbolt, named after Capt. George Eyston's record-breaking car, has a steel top that completely disappears in the deck, at the touch of a button.



**BUICK FIREBALL** One of the crowd catchers at the New York Automobile Show was this "car of the future" called the Buick Fireball. The car, designed by Harley Earle, supervisor of General Motors styling division, is ultra-streamlined and has a 125 horsepower engine. If this smart job is the car of the future, bring on the future, we say.



**FAMOUS DRIVERS** Left to right: George Robertson, winner of the 1908 Vanderbilt Cup Race; Wilbur Shaw, three-time Indianapolis winner; Montague Roberts, who won the "Round the World Race" in 1908; Ralph DePalma, track champion for many years; and "Cannon Ball" Baker, cross-country record maker.

## M.E.M.A. Index Shows Advance

Shipments in all divisions of the industry advanced in August over the previous month according to manufacturers reporting their monthly business figures to Motor and Equipment Manufacturers Assn. With the exception of accessories all classifications continue to be above the indices for the same month in 1939.

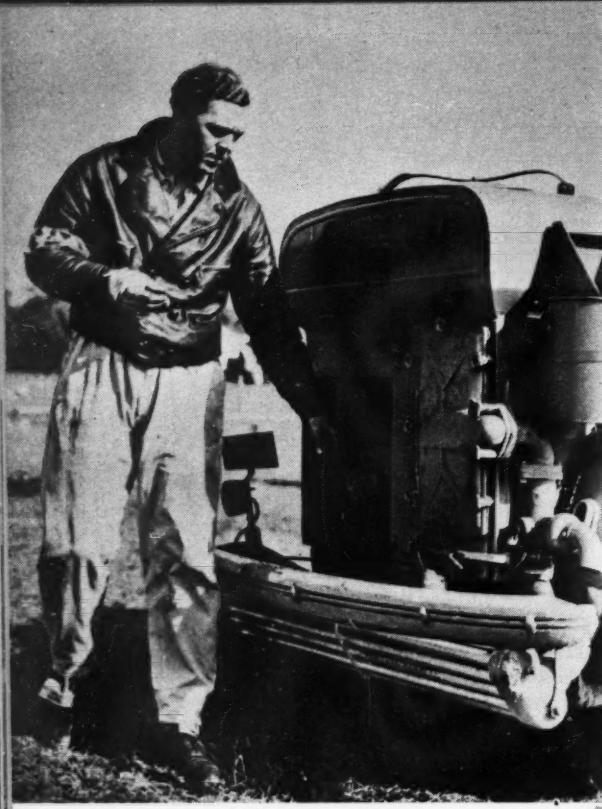
The Grand Index for all branches of the industry in August rose to 151 per cent of the January, 1925, base as compared with 126 per cent for July and 117 per cent for August, 1939.

Shipments to vehicle manufacturers for original equipment in August advanced to 147 per cent of the base, which compares with 101 per cent registered in July and 96 per cent for August last year.

Service parts shipments to wholesalers for August rose to 196 per cent of the base as compared to 172 per cent in July, 1940. In August, 1939, the index stood at 166 per cent. Accessories shipments to wholesalers in August increased, standing at 98 per cent of the base index, which compares with 93 per cent in July, 1940, and 104 per cent in August, 1939. Service equipment shipments to wholesalers in August advanced.

## What is a "Pleasure Car"?

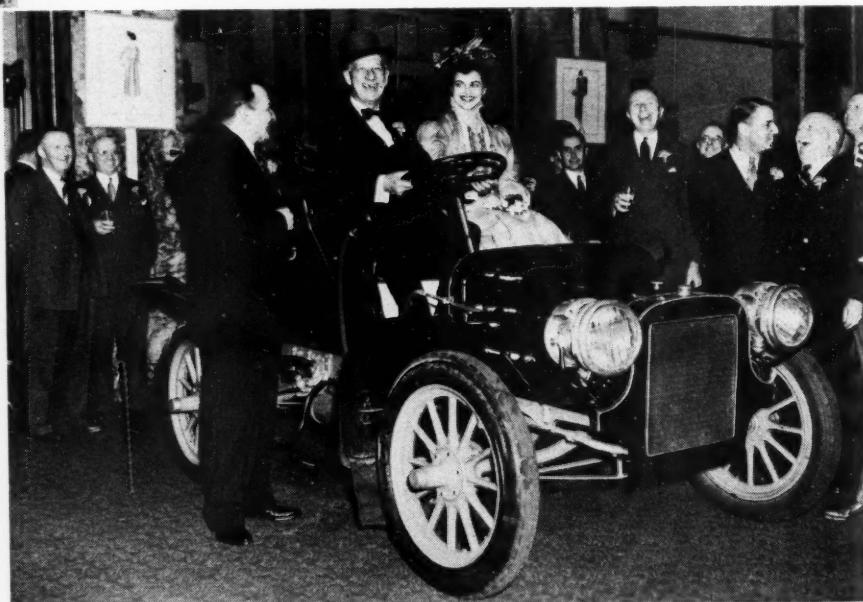
During the early days of the automobile, passenger cars were called "pleasure cars." But that name no longer is descriptive, according to the U. S. Public Roads Administration. In a study of highway traffic in 25 states, the administration found that 55 per cent of passenger car mileage is used on business trips and that only 45 per cent is for purely recreational or social purposes. Farmers use their cars about two-thirds of the time for business. In the large cities use of passenger cars is approximately evenly divided between business and recreation.



**PRINCE AMONG RACERS** Prince Bertil (left) of Sweden recently took part in an automobile race with cars run exclusively by wood-gas (or charcoal gas) burning engines. The contest was sponsored by the Royal Automobile Club of Sweden. The photo shows the Prince inspecting his car before starting the race.

**THE GOVERNOR RIDES AGAIN** Former N. Y. Governor Alfred E. Smith demonstrates the proper driving form in handling the 1904 Cadillac at the General Motors Show at the Waldorf-Astoria, last month. The demonstration was for the benefit of William S. McLean, director of advertising for Fisher Body. Miss Dorothy Snyder is the little lady in the smart (1904) attire.

**ON LAND AND IN THE AIR** The sketch (bottom of column) shows the most recent combination airplane-automobile, called the "Aerobile." George W. Cornelius, Dayton, O., is designer and president of the Cornelius-Hoepli Corp. The drawing shows the Aerobile operating with wings detached, as an automobile. The machine has passed successful windtunnel tests, it is said, although it had not received an experimental license from the Department of Commerce, at the time the picture was received by us.



## **Navy Pier Shortened; A.S.I.S. Marathon Ended**

The mile-long Navy Pier of Chicago has been shortened and streamlined in preparation of this year's great Automotive Service Industries Show, Dec. 9-14. In fact, the pier has been made twice as wide and half as long for the comfort and convenience of jobbers and manufacturers who attend.

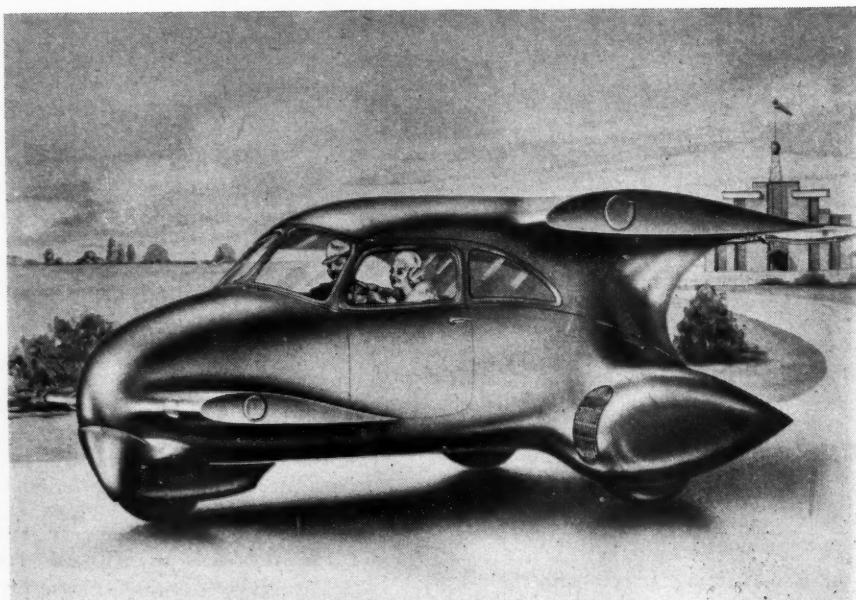
The A.S.I.S. is the breeding ground for 1941 merchandising activities in the after market. Jobbers attend the show to contact parts, tools, equipment, accessories and supplies makers. In their conferences ways and means are thereby developed to help servicemen and repair shop operators sell more after-market merchandise in the coming year.

## **N.A.D.A. Convention Plans**

Plans for the 24th annual convention of the N.A.D.A. were among the matters discussed at a meeting of the executive committee in New York. The convention will be held in Pittsburgh, Pa., January 20-23, 1941. Edgar D. McKean of Pittsburgh, a vice-president of N.A.D.A., has been appointed convention chairman.

The N.A.D.A. committee consists of L. C. Cargile, Texarkana, Texas; Lynn B. Snow, Oak Park, Ill.; W. L. Mallon, Newark, N. J., and President Stanley H. Horner, Washington, D. C.

Members of the Pittsburgh group are Jack Stevens, vice-chairman; R. H. Brandt, transportation; W. N. Ownings, special events; H. D. Eirman, reception; Roy M. Howard, entertainment; Fred E. Holler, attendance; and C. L. Nutter, publicity.



# Mechanical Specifications

These Specifications Are Brought Up-to-Date Each Month by the  
Car Manufacturers and Supersede All Others Previously Published

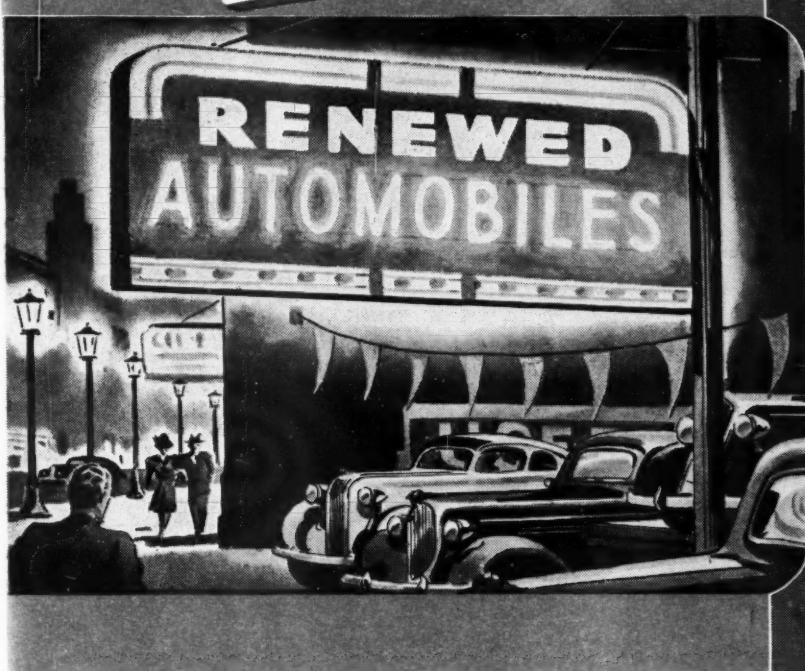
MAKE AND MODEL	Lowest Priced 4-D. Sed. (Devl'd.)	Wheelbase (In.)	Tire Size (In.)	No. of Cylinders, Bore and Stroke	ENGINE												CHASSIS								
					Taxable Hp.	Piston Displacement (Cu. In.)	Maximum Brake Hp. at Specified R.P.M.	Compression Ratio (to 1)	Displacement Factor †	Cylinder Head Material	Crankshaft Drive Make	Piston Material	Oil Cleaner Make	Air Cleaner Make	Carburetor Make	Muffler Make	Electrical System Make	Battery Make	Clutch	Universal Joint Type and Make	Rear Axle Type and Make	Rear Axle Ratio	Front Spring Suspension		
Bantam	65	449	75	4.00/15	4-2.26x3.12	8.2	50.14	22-3800	7.40	...	CI	Own	AI	None	AC	Z	Mc	AL	P-Ro	UP	1/2 Spi	5.25	Tr		
Buick	41-40	1052	121	6.50/16	8-3 1/2x4 1/2	30.6	248.0	115-3500	6.50	36.4	CI	LB	AI	AC	AC	Hay	DR	DR	P-Obl	Mp-S-S	1/2	Own	4.40	IC	
Buick	41-50	1185	121	6.50/16	8-3 1/2x4 1/2	30.6	248.0	115-3800	7.00	33.6	CI	LB	AI	AC	AC	Hay	DR	DR	P-Obl	Mp-S-S	1/2	Own	4.10	IC	
Buick	41-60	1288	126	7.00/15	8-3 1/2x4 1/2	37.8	320.2	165-3800	7.00	39.0	CI	LB	AI	AC	AC	Hay	DR	DR	P-Obl	Mp-S	1/2	Own	3.90	IC	
Buick	41-70	1364	126	7.00/15	8-3 1/2x4 1/2	37.8	320.2	165-3800	7.00	39.1	CI	LB	AI	AC	AC	Hay	DR	DR	P-Obl	Mp-S	1/2	Own	3.90	IC	
Buick	41-90	2155	139	7.50/16	8-3 1/2x4 1/2	37.8	320.2	165-3800	7.00	...	CI	LB	AI	AC	AC	Hay	DR	DR	P-Obl	Mp-S	1/2	Own	4.18	IC	
Cadillac V8. 61,62,63,60S	1445	126	7.00/15	8-3 1/2x4 1/2	39.2	346.0	150-3400	7.25	...	CI	LB	AI	None	AC	S-C	Wal	DR	DR	P-Long	Nb-Mec	1/2	Own	3.77	IC	
Cadillac V8.	67.75	2595	139-136	7.50/16	8-3 1/2x4 1/2	39.2	346.0	150-3400	7.25	...	CI	LB	AI	None	AC	S-C	Wal	DR	DR	P-Long	Nb-Mec	1/2	Own	4.27	IC
Chevrolet Sp.DL & M.DL	795	116	6.00/16	6-3 1/2x3 1/4	29.4	216.5	90-...	6.50	35.2	CI	Dia	CI	None	AC	Car	Var	DR	DR	P-Own	Nb-Own	1/2	Own	4.11	IC	
Chrysler	C-28	1051	121 1/2	6.25/16	6-3 1/2x4 1/2	27.3	241.5	112-3600	6.80	35.1	CI	Mor	AI	Pur	AC	Car	...	AL	Wil	P-B&B	rb	1/2	3.90	IC	
Chrysler	C-30N, C-30K	1278	127 1/2	7.00/15	8-3 1/2x4 1/2	33.8	323.5	137-3400	6.80	41.5	CI	Whit	AI	Pur	AC	Str	...	AL	Wil	P-B&B	rb	1/2	3.91	IC	
Chrysler	C-33	145 1/2	7.50/15	8-3 1/2x4 1/2	33.8	323.5	140-3400	6.80	...	AI	Whit	AI	Pur	AC	Str	...	AL	Wil	P-B&B	rb	1/2	4.55	IC		
Crosley	CB-41	366	80	4.25/12	2-3x2 1/2	7.2	35.3	12-4000	5.60	...	CI	Wau	CI	None	AC	Til	Own	AL	AL	P-Ro	Mp-S	1/2	Spi	5.14	C
De Soto-DeL. & Cust. S-8	995	121 1/2	6.25/16	6-3 1/2x4 1/2	27.3	228.1	105-3600	6.80	35.5	CI	Mor	AI	Pur	AC	Car	...	AL	Wil	P-B&B	rb	1/2	4.10	IC		
Dodge-DeL. & Cust. D-19	920	119 1/2	6.00/16	6-3 1/2x4 1/2	25.3	217.8	91-3800	6.50	...	CI	Mor	AI	Pur	AC	Str	...	AL	AL	P-B&B	bt	1/2	4.30	IC		
Ford-DeL. & Sup. DeL. 85	740	114	6.00/16	8-3.062x3.75	30.0	221.0	85-3800	6.15	...	CI	Dia	CS	...	...	Own	Own	Own	Own	P-Long	Own	3/4	Own	3.78	Tr	
Hudson-DeL. & Tr. 6. 10	793	116	(d)	6-3x4 1/2	21.6	175.0	92-4000	7.25	34.8	CI	Dia	AI	None	AC	Car	Old	AL	Na	P-Own	Nb-S	1/2	Own	4.55	IC	
Hud-Sup. & Com. 6. 11,12	932	121	(f)	6-3x5	21.6	212.0	102-4000	6.50	35.4	CI	Dia	AI	None	Un	Car	Old	AL	Na	P-Own	Nb-S	1/2	Own	4.11	IC	
Hudson-Com'dore 8. 14	1039	121	6.25/16	8-3x4 1/2	28.8	254.0	128-4200	6.50	39.6	CI	Dia	AI	None	Un	Car	Old	AL	Na	P-Own	Nb-S	1/2	Own	4.11	IC	
Hudson-Comm. Cus. 8. 17	1232	128	6.50/16	8-3x4 1/2	28.8	254.0	128-4200	6.50	...	CI	Dia	AI	None	Un	Car	Old	AL	Na	P-Own	Nb-S	1/2	Own	4.11	IC	
Lincoln-Zeph. & Cont. V-12	1450	125	7.00/16	12-2.875x3.75	39.6	292.0	120-3500	7.00	...	CI	Dia	CS	...	...	Own	Own	Own	Own	P-Long	Own	3/4	Own	4.44	Tr	
Lincoln-Custom. V-12	1550	138	7.00/16	12-2.875x3.75	39.6	292.0	120-3500	7.00	...	CI	Dia	CS	...	...	Own	Own	Own	Own	P-Long	Own	3/4	Own	4.44	Tr	
Mercury	95	960	118	6.50/16	8-3.187x3.75	32.5	239.0	95-3600	6.15	...	CI	Dia	CS	...	...	Own	Own	Own	Own	P-Long	Own	3/4	Own	3.54	Tr
Nash-Amb. 600	4140	780	112	5.50/16	6-3 1/2x3 1/4	23.4	172.6	76-3600	6.70	33.4	CI	W-D	AI	None	AC	Car	Wal	DR	AL	P-B&B	m-Mec	1/2	Own	4.11	IC
Nash-Amb. 6.	4160	930	121	6.25/16	6-3 1/2x4 1/2	27.3	234.8	105-3400	6.30	35.6	CI	W-D	AI	Pur	AC	Car	Wal	AL	AL	P-B&B	m-Mec	1/2	Own	4.10	IC
Nash-Amb. 8.	4180	1050	121	6.50/16	8-3 1/2x4 1/2	31.2	260.8	115-3400	6.30	38.2	CI	W-D	AI	Pur	AC	Car	Wal	AL	AL	P-B&B	m-Mec	1/2	Own	4.10	IC
Oldsmobile Special 6	945	119	6.00/16	6-3 1/2x4 1/2	29.4	238.0	100-3300	6.20	37.7	CI	LB	AI	None	AC	Car	Hay	DR	DR	P-B&B	m-Mec	1/2	Own	4.10	IC	
Oldsmobile Dynamic 6	1010	125	6.50/16	6-3 1/2x4 1/2	29.4	238.0	100-3300	6.20	37.2	CI	LB	AI	None	AC	Car	Hay	DR	DR	P-B&B	m-Mec	1/2	Own	4.30	IC	
Oldsmobile Custom 6	1099	125	7.00/15	6-3 1/2x4 1/2	29.4	238.0	100-3300	6.20	37.0	CI	LB	AI	None	AC	Car	Hay	DR	DR	P-B&B	m-Mec	1/2	Own	4.30	IC	
Oldsmobile Special 8	987	119	6.00/16	8-3 1/2x3 1/2	33.8	257.0	110-3500	6.30	38.4	CI	LB	AI	None	AC	Car	Hay	DR	DR	P-B&B	m-Mec	1/2	Own	4.10	IC	
Oldsmobile Dynamic 8	1045	125	6.50/16	8-3 1/2x3 1/2	33.8	257.0	110-3500	6.30	39.0	CI	LB	AI	None	AC	Car	Hay	DR	DR	P-B&B	m-Mec	1/2	Own	4.30	IC	
Oldsmobile Custom 8	1135	125	7.00/15	8-3 1/2x3 1/2	33.8	257.0	110-3500	6.30	39.0	CI	LB	AI	None	AC	Car	Hay	DR	DR	P-B&B	m-Mec	1/2	Own	4.30	IC	
Packard-110	1900	1056	122	6.50/15	6-3 1/2x4 1/2	29.4	245.0	100-3600	6.39	...	CI	Mor	Als	...	AC	Str	...	A-D	...	P-Long	UP	1/2	Own	4.30	IC
Packard-120	1901	127	7.00/15	8-3 1/2x4 1/2	33.8	282.0	120-3600	6.41	40.6	CI	Mor	Als	...	AC	Str	Wal	AL	AL	P-Long	rb-Mec	1/2	Own	4.09	IC	
Packard-160	1903, 4, 5	1750	127-38-48	7.00/16	8-3 1/2x4 1/2	39.2	325.6	160-3600	6.45	43.8	CI	Mor	Als	Pur	AC	Str	...	AL	AL	P-Long	rb-Mec	1/2	Own	(g)	IC
Packard-180	1906, 7, 8	2587	127-38-48	7.00/16	8-3 1/2x4 1/2	39.2	356.0	160-3600	6.45	43.8	CI	Mor	Als	Pur	AC	Str	...	AL	AL	P-Long	rb-Mec	1/2	Own	(g)	IC
Plymouth	P-11	780	117	6.00/16	6-3 1/2x4 1/2	23.4	201.3	87-3800	6.70	36.1	CI	Mor	AI	Pur	AC	Car	...	AL	AL	P-B&B	bt	1/2	Own	4.10	IC
Plymouth-Spe. DeL. P-12	840	117	6.00/16	6-3 1/2x4 1/2	23.4	201.3	87-3800	6.70	36.1	CI	Mor	AI	Pur	AC	Car	...	AL	AL	P-B&B	bt	1/2	Own	4.30	IC	
Pontiac-DeL. 6. 41-25	921	119	6.00/16	6-3 1/2x4	30.4	239.2	90-3200	6.50	...	CI	Mor	CN	None	AC	Car	Var	DR	DR	P-Inl	rb-SM	1/2	Own	4.10	IC	
Pontiac-Stream. 6. 41-26	980	122	6.50/16	6-3 1/2x4	30.4	239.2	90-3200	6.50	...	CI	Mor	CN	None	AC	Car	Var	DR	DR	P-Inl	rb-SM	1/2	Own	4.30	IC	
Pontiac-Custom. 6. 41-24	122	122	6.50/16	6-3 1/2x4	30.4	239.2	90-3200	6.50	...	CI	Mor	CN	None	AC	Car	Var	DR	DR	P-Inl	rb-SM	1/2	Own	4.30	IC	
Pontiac-DeL. 8. 41-27	946	119	6.00/16	8-3 1/2x3 1/2	33.8	248.9	103-3500	6.50	...	CI	Mor	CN	None	AC	Car	Var	DR	DR	P-Inl	rb-SM	1/2	Own	4.10	IC	
Pontiac-Stream. 8. 41-28	1005	122	6.50/16	8-3 1/2x3 1/2	33.8	248.9	103-3500	6.50	...	CI	Mor	CN	None	AC	Car	Var	DR	DR	P-Inl	rb-SM	1/2	Own	4.30	IC	
Pontiac-Custom. 8. 41-29	1077	122	6.50/16	8-3 1/2x3 1/2	33.8	248.9	103-3500	6.50	...	CI	Mor	CN	None	AC	Car	Var	DR	DR	P-Inl	rb-SM	1/2	Own	4.30	IC	
Studebaker-Champ. 6. 3G	770	110	5.50/16	6-3x4	21.6	169.6	80-4000	6.50	39.2	CI	Dia	AI	None	AC	Car	Wal	AL	Wil	P-B&B	Mp-S	1/2	Spi	4.56	IT	
Studebaker-Com. 6. 11A	985	119	6.25/16	6-3 1/2x4 1/2	28.3	226.2	94-3600	6.50	40.2	CI	Dia	AI	Fram	AC	Str	Wal	AL	Wil	P-B&B	Mp-S	1/2	Spi	4.55	IT	
Studebaker-Pres. 8. 7C	1115	124																							

# Tune-Up Specifications

These Specifications Are Brought Up-to-Date Each Month by the Car Manufacturers and Supersede All Others Previously Published

MAKE AND MODEL	Compression Pressure at Cranking Speed (Lbs.)	Spark Plugs	RINGS		VALVES								IGNITION								FRONT AXLE													
			No. and Width Compression		No. and Width Oil		Inlet Seat Angle (Degrees)		Exhaust Seat Angle (Degrees)		Stem Diameter (In.)		Operating Tappet Clearance		Inlet Tappet Clearance for Valve Timing		Inlet Valve Opens Before or After T. C.		Timing				Rods Removed From		Capacity Crankcase (Quarts), Dry		Caster (Degrees)		Camber (Degrees)		Toe-in (Inches)		King Pin Inclination (Degrees)	
			Make and Type	Width	Width	Oil	Width	Oil	Width	Oil	Width	Oil	Width	Oil	Width	Oil	Width	Oil	Width	Oil	Width	Oil	Width	Oil	Width	Oil	Width	Oil	Width	Oil	Width	Oil		
Bantam	65	135	Ch-H10	2- $\frac{3}{8}$	1- $\frac{1}{8}$	45	45	.279	.011H	.012H	.011	19B	4 $\frac{1}{4}$ B	.022	46	.025	4B	1B	None	A	3	5 $\frac{1}{2}$	15	1°-15'	$\frac{1}{8}$	1 $\frac{1}{2}$								
Buick	41-40	142	AC-104	2- $\frac{3}{8}$	2- $\frac{1}{8}$	45	45	.372	.015H	.015H	11	13B	5 $\frac{1}{4}$ B	.015	31	.025	2B	1B	Fly	A	8	13	3 $\frac{1}{2}$ ± $\frac{1}{2}$	N $\frac{1}{2}$ -1 $\frac{1}{2}$	0- $\frac{1}{8}$	3 $\frac{1}{2}$								
Buick	41-50	148	AC-104	2- $\frac{3}{8}$	2- $\frac{1}{8}$	45	45	.372	.015H	.015H	11	13B	5 $\frac{1}{4}$ B	.015	31	.025	4B	1B	Fly	A	8	13	3 $\frac{1}{2}$ ± $\frac{1}{2}$	N $\frac{1}{2}$ -1 $\frac{1}{2}$	0- $\frac{1}{8}$	3 $\frac{1}{2}$								
Buick	41-60	151	AC-104	2- $\frac{3}{8}$	2- $\frac{1}{8}$	45	45	.375	.015H	.015H	11	14B	6B	.015	31	.025	6B	2 $\frac{1}{2}$ B	None	A	10	16 $\frac{3}{4}$	3 $\frac{1}{2}$ ± $\frac{1}{2}$	N $\frac{1}{2}$ -1 $\frac{1}{2}$	0- $\frac{1}{8}$	3 $\frac{1}{2}$								
Buick	41-70	151	AC-104	2- $\frac{3}{8}$	2- $\frac{1}{8}$	45	45	.375	.015H	.015H	11	14B	6B	.015	31	.025	6B	2 $\frac{1}{2}$ B	None	A	10	18	3 $\frac{1}{2}$ ± $\frac{1}{2}$	N $\frac{1}{2}$ -1 $\frac{1}{2}$	0- $\frac{1}{8}$	3 $\frac{1}{2}$								
Buick	41-90	151x	AC-104	2- $\frac{3}{8}$	2- $\frac{1}{8}$	45	45	.375	.015H	.015H	11	14B	6B	.015	31	.025	6B	2 $\frac{1}{2}$ B	None	A	10	18	3 $\frac{1}{2}$ ± $\frac{1}{2}$	N $\frac{1}{2}$ -1 $\frac{1}{2}$	0- $\frac{1}{8}$	3 $\frac{1}{2}$								
Cadillac V8 . . . 61,62,63,60S	182x	AC-104	2-(c)	2- $\frac{3}{8}$	45	45	.341	AA	AA	AA	TC	TC	.0125	31	.025	5B	2B	TD	A	7	25	-1 $\frac{1}{2}$ -N2	3 $\frac{1}{2}$ -3 $\frac{1}{2}$	5°-51'										
Cadillac V8 . . . 67, 75	182x	AC-104	2-(c)	2- $\frac{3}{8}$	45	45	.341	AA	AA	AA	TC	TC	.0125	31	.025	5B	2B	TD	A	7	25	-1 $\frac{1}{2}$ -N2	3 $\frac{1}{2}$ -3 $\frac{1}{2}$	5°-51'										
Chevrolet Sp.DL & M.DL	AC-104	2- $\frac{1}{8}$	1- $\frac{1}{8}$	30	30	.340	.006H	.013H	.006	3B	1B	.018	39	.040	5B	2B	Fly	A	5 $\frac{1}{2}$	14	0- $\frac{1}{2}$	N $\frac{1}{4}$ -3 $\frac{1}{2}$	0- $\frac{1}{8}$	4 $\frac{1}{4}$ -4 $\frac{1}{2}$										
Chrysler . . . C-28	145x	AL-A7	2- $\frac{1}{8}$	2- $\frac{3}{8}$	45	45	.340	.008H	.010H	.014	12B	4 $\frac{1}{4}$ B	.020	34 $\frac{1}{2}$ -38	.025	TC	TC	VD	A	5	18	N1-+1	0- $\frac{1}{4}$	4 $\frac{1}{4}$ -6										
Chrysler . . . C-30N, C-30	155x	AL-A7	2- $\frac{1}{8}$	2- $\frac{3}{8}$	45	45	.340	.008H	.010H	.011	6B	2 $\frac{1}{2}$ B	.018	27-30 $\frac{1}{2}$	.025	TC	TC	VD	A	6	24	N1-+1	0- $\frac{1}{4}$	4 $\frac{1}{4}$ -6										
Chrysler . . . C-33	155x	AL-AL7	2- $\frac{1}{8}$	2- $\frac{3}{8}$	45	45	.340	.008H	.010H	.011	6B	2 $\frac{1}{2}$ B	.018	27-30 $\frac{1}{2}$	.025	3B	1B	VD	A	6	24	N1-+1	0- $\frac{1}{4}$	4 $\frac{1}{4}$ -6										
Crosley	CB-41	80	AL-A5	2- $\frac{1}{8}$	1- $\frac{1}{8}$	45	45	.311	.006C	.008C	20B	5B	.020	46	.025	TC	TC	Fly	A	3	6 $\frac{1}{2}$ -11	2	$\frac{1}{16}$	6 $\frac{1}{2}$										
De Soto-Del. & Cust.	S-8	150x	AL-A7	2- $\frac{1}{8}$	2- $\frac{3}{8}$	45	45	.340	.008H	.010H	.014	12B	2 $\frac{1}{2}$ B	.020	34 $\frac{1}{2}$ -38	.025	...	VD	A	5	18	N1-+1	0- $\frac{1}{4}$	0- $\frac{1}{8}$	4 $\frac{1}{4}$ -6									
Dodge-Del. & Cust.	D-19	...	AL-A7	2-(c)	2- $\frac{3}{8}$	45	45	.340	.008H	.010H	.014	9B	3 $\frac{1}{2}$ B	.020	34 $\frac{1}{2}$ -38	.025	TC	TC	VD	A	5	15	N1-+1	0- $\frac{1}{4}$	0- $\frac{1}{8}$	4 $\frac{1}{4}$ -6								
Ford-Del. & Sup. Del.	85	100	Ch-H10	2-(b)	1-(f)	45	45	(k)	.011C	.011C	...	TC	TC	.015	...	.025	4B	1 $\frac{1}{4}$ B	Dist	A	5	23 $\frac{1}{4}$	4 $\frac{1}{2}$ -9	1 $\frac{1}{4}$ -1	$\frac{1}{16}$	8								
Hudson-Del. & Tr. 6 . . . 10	125	Ch-J9	2- $\frac{3}{8}$	2-(d)	45	45	.341	.006H	.008H	10B	3 $\frac{1}{2}$ B	.020	35	.032	TC	TC	Fly	A	6	13	0± $\frac{1}{4}$	1 $\frac{1}{4}$ -1 $\frac{1}{2}$	0- $\frac{1}{8}$	3 $\frac{1}{2}$ -3 $\frac{1}{2}$										
Hud-Sup. & Com. 6 . . . 11, 12	120	Ch-J9	2- $\frac{3}{8}$	2-(d)	45	45	.341	.006H	.008H	10B	3 $\frac{1}{2}$ B	.020	35	.032	TC	TC	Fly	A	6	13	0± $\frac{1}{4}$	1 $\frac{1}{4}$ -1 $\frac{1}{2}$	0- $\frac{1}{8}$	3 $\frac{1}{2}$ -3 $\frac{1}{2}$										
Hudson-Com'dore 8 . . . 14	119	Ch-J9	2- $\frac{3}{8}$	2-(d)	45	45	.343	.006H	.008H	10B	3 $\frac{1}{2}$ B	.017	30 $\frac{1}{2}$	.032	TC	TC	Fly	A	9	18	0± $\frac{1}{4}$	2 $\frac{1}{2}$ -3 $\frac{1}{2}$	0- $\frac{1}{8}$	3 $\frac{1}{2}$ -3 $\frac{1}{2}$										
Hudson-Comm. Cus. 8 . . . 17	119	Ch-J9	2- $\frac{3}{8}$	2-(d)	45	45	.343	.006H	.008H	10B	3 $\frac{1}{2}$ B	.017	30 $\frac{1}{2}$	.032	TC	TC	Fly	A	9	18	0± $\frac{1}{4}$	2 $\frac{1}{2}$ -3 $\frac{1}{2}$	0- $\frac{1}{8}$	3 $\frac{1}{2}$ -3 $\frac{1}{2}$										
Lincoln-Zeph. & Cont. V-12	...	Ch-H10	2-(g)	1-(h)	45	45	.311	.013C	.013C	10 $\frac{1}{2}$ B	31 $\frac{1}{4}$ B	.015	...	.029	4B	1 $\frac{1}{4}$ B	Dist	A	5	22	3-5	1 $\frac{1}{4}$ -3 $\frac{1}{4}$	$\frac{1}{16}$	3 $\frac{1}{4}$ -4 $\frac{1}{4}$										
Lincoln-Custom . . . V-12	...	Ch-H10	2-(g)	1-(h)	45	45	.311	.013C	.013C	10 $\frac{1}{2}$ B	31 $\frac{1}{4}$ B	.015	...	.029	4B	1 $\frac{1}{4}$ B	Dist	A	5	22	3-5	1 $\frac{1}{4}$ -3 $\frac{1}{4}$	$\frac{1}{16}$	3 $\frac{1}{4}$ -4 $\frac{1}{4}$										
Mercury	95	100	Ch-H10	2-(b)	1-(f)	45	45	(k)	.011C	.011C	...	TC	TC	.015	...	.025	4B	1 $\frac{1}{4}$ B	Dist	A	5	23 $\frac{1}{4}$	4 $\frac{1}{2}$ -9	1 $\frac{1}{4}$ -1	$\frac{1}{16}$	8								
Nash-Amb. 600 . . . 4140	120	AL-ANT7	2- $\frac{3}{8}$	1- $\frac{1}{8}$	45	45	.341	.015	.015	.010	6B	2B	.018	35	.025	TC	TC	VD	A	5	14	0	0- $\frac{1}{2}$	0- $\frac{1}{8}$	5 $\frac{1}{2}$									
Nash-Amb. 6 . . . 4160	125	AC-	2- $\frac{3}{8}$	2- $\frac{1}{8}$	45	45	.372	.015	.015	.015	24B	6B	.020	35	.023	...	VD	A	6	17	0-N $\frac{1}{2}$	1 $\frac{1}{4}$ -3 $\frac{1}{4}$	$\frac{1}{16}$	4 $\frac{1}{2}$										
Nash-Amb. 8 . . . 4180	110	AC-	2- $\frac{3}{8}$	2-(e)	45	45	.372	.015	.015	.015	19B	6B	.020	28	.023	9B	2 $\frac{1}{2}$ B	VD	A	7	16	0-N $\frac{1}{2}$	1 $\frac{1}{4}$ -3 $\frac{1}{4}$	$\frac{1}{16}$	4 $\frac{1}{2}$									
Oldsmobile . . . Special 6	115	AC-44	2- $\frac{3}{8}$	2- $\frac{1}{8}$	30	45	.342	.008H	.011H	.012	5B	2B	.020	35	.040	TC	TC	Fly	A	5	18	0-N $\frac{1}{2}$	1 $\frac{1}{4}$ -3 $\frac{1}{4}$	4 $\frac{1}{2}$ -5 $\frac{1}{2}$										
Oldsmobile . . . Dynamic 6	115	AC-44	2- $\frac{3}{8}$	2- $\frac{1}{8}$	30	45	.342	.008H	.011H	.012	5B	2B	.020	35	.040	TC	TC	Fly	A	5	18	0-N $\frac{1}{2}$	1 $\frac{1}{4}$ -3 $\frac{1}{4}$	4 $\frac{1}{2}$ -5 $\frac{1}{2}$										
Oldsmobile . . . Custom 6	115	AC-44	2- $\frac{3}{8}$	2- $\frac{1}{8}$	30	45	.342	.008H	.011H	.012	5B	2B	.020	35	.040	TC	TC	Fly	A	5	18	0-N $\frac{1}{2}$	1 $\frac{1}{4}$ -3 $\frac{1}{4}$	4 $\frac{1}{2}$ -5 $\frac{1}{2}$										
Oldsmobile . . . Special 8	107	AC-44	2- $\frac{3}{8}$	2- $\frac{1}{8}$	30	45	.342	.008H	.011H	.012	TC	TC	.015	31	.030	2B	2B	Fly	A	6	22	0-N $\frac{1}{2}$	1 $\frac{1}{4}$ -3 $\frac{1}{4}$	4 $\frac{1}{2}$ -5 $\frac{1}{2}$										
Oldsmobile . . . Dynamic 8	107	AC-44	2- $\frac{3}{8}$	2- $\frac{1}{8}$	30	45	.342	.008H	.011H	.012	TC	TC	.015	31	.030	2B	2B	Fly	A	6	22	0-N $\frac{1}{2}$	1 $\frac{1}{4}$ -3 $\frac{1}{4}$	4 $\frac{1}{2}$ -5 $\frac{1}{2}$										
Packard-110	...	1900	(a)	2-(m)	1- $\frac{1}{8}$	30	45	.339	.007H	.010H	.012	1B	1 $\frac{1}{2}$ B	.020	35	.028	6B	2 $\frac{1}{2}$ B	...	A	5	15	1 $\frac{1}{2}$ -1 $\frac{1}{2}$	1 $\frac{1}{2}$ -3 $\frac{1}{2}$	0- $\frac{1}{8}$ -2 $\frac{1}{2}$									

*Make that sign mean what it says-*



REPLACE WORN  
PISTONS WITH  
LYNITE\* T-SLOT

LO-EX  
REG. U. S. PAT. OFF.  
PISTONS

Used car dealer or repair shop, your success as a money-maker depends upon the lasting ability of the jobs you turn out.

It's a waste of money to install makeshift gadgets. Engines give far better service and cost less to drive when cylinders are rebored and new pistons installed to fit. And you get new-engine performance by using Lynite T-Slot LO-EX

Pistons. Look for the trademark on every piston.

The light weight of these pistons reduces bearing pressures, so bearings last longer. They have low coefficient of expansion, permit close clearances, provide maximum heat flow. Oil and gas consumption, and carbon formation, are less. ALUMINUM COMPANY OF AMERICA,

2133 Gulf Building, Pittsburgh, Penna.

\*Reg. T. M. Aluminum Company of America



LYNITE LO-EX PISTONS—A PRODUCT OF

**ALCOA · ALUMINUM**

CAST ONLY BY ALUMINUM COMPANY OF AMERICA

# SUPER MAINTENANCE IN PITTSBURGH

(Continued from page 19)

There are seven departments in the service branch of Eierman Cadillac. Each earns its share of the total gross earnings, and here are Mr. Newmeyer's figures. In other words, here's how the automotive dollar is spent in this super-maintenance department:

Major Overhaul department ...	45%
Front End and Wheel Balancing department	5

Body & Fender Bump-out department	10
Paint department	10
Upholstery & Trim department	5
Electrical department	5
Carburetor & Motor Tune-up department	10
Lubrication department	10

100%

How do those figures compare with your own business? It would be interesting to have yours, for a general

comparison of all the service trade. Spencer King is service manager and divides his department into seven units. The Lubrication Department: which includes two hydraulic lifts, cabinet-type lubricating equipment and a crankcase flusher. The Paint Department has a spray booth that will accommodate five cars, paint spray equipment and portable power polisher. It is equipped with a modern ventilating system which changes the air in the room three times every minute. Explosion-proof lights and wire mesh windows are additional safety features.

The Front End Department uses a wheel aliner and dynamic wheel balancing machine. Power vacuum cleaners and sewing machines are found in the Upholstery and Trim Department. Equipment in the fender and Body Bump-Out Department includes power grinders, welding equipment and power straightening machines. The Electrical Department is equipped with a motor analyzer, headlight tester, radio tube tester, battery charger and other electrical equipment. The Motor Tune-up Department uses an oscilloscope and an exhaust gas analyzer. The Mechanical Department is fully equipped. Some of the leading pieces of equipment include valve refacers, drill presses, a small lathe and a portable crane. Work benches and individual steel mechanic's chest are used.

## Under-the-Hood

(Continued from page 23)

an important part in keeping the engine cool. Any external coating on the engine acts as an insulator, preventing radiation, and throws the entire burden of cooling on the cooling system. The result is that a dirty engine operates at a higher temperature than a clean one.

That's where the service man who is equipped to offer engine cleaning service comes into the picture. He can clean the engine as a side line to regular car washing, and make a little extra profit. There are a number of chemicals on the market, designed specifically for this type of service. They can be either sprayed on the engine or applied with a brush, and then flushed off with a pressure hose. The cost is low, because most of these chemicals are used in a solution of water or kerosene in the proportions of about 8 parts of kerosene to one part of cleaning compound. An extra five or ten minutes added to the regular car washing time are sufficient to cover cleaning the engine.



Old air compressors are too expensive for other successful operators to use. That's why they change over to Kellogg. Then can you afford an old compressor?

Chances are you don't know how much wasted current you pay for each month. Every dollar you spend repairing your old compressor is that much added investment in a dying horse. The longer it lives the more you'll spend.

Stop spending. Invest. Own a new efficient Kellogg — stingy with current, stingy with oil, but hurling generous quantities of clean air on demand. And silent as a whisper, because it's rubber-cushioned. Know the story of Kellogg economy *before* you decide to support the old compressor or any longer.

**IT COSTS YOU NOTHING TO LEARN KELLOGG AIR COMPRESSOR MONEY-SAVING FACTS.**  
**NOT TO KNOW MAY COST MORE THAN YOU THINK.**

Sales Offices: 332 S. Michigan Ave., Chicago, Ill.; 230 Park Avenue, New York, N. Y.; 3355 East Slavson Ave., Los Angeles, Calif.; 4785 First Ave., South, Seattle, Washington; Niagara Falls, Ont., Canada.

**KELLOGG** DIVISION OF THE AMERICAN BRAKE  
SHOE & FOUNDRY CO., ROCHESTER, N. Y.

**KELLOGG**  
AIR COMPRESSORS  
LIFTS • CAR WASHERS

# Studebaker scores again with another exclusive "first"



## *Big, roomy, beautiful, new 1941* **STUDEBAKER CHAMPION**

Your opportunity to get the lion's share of the volume business in your territory

*Why there's money in it for you*

In handling the complete Studebaker line of passenger cars, commercial cars and trucks:

- YOU MAKE JUST ONE INVESTMENT!
- YOU PAY JUST ONE OVERHEAD!
- YOU CARRY JUST ONE LINE OF PARTS!
- YOU ADVERTISE JUST ONE NAME!
- YOU BUY JUST ONE ELECTRIC SIGN!
- YOU DO BUSINESS WITH JUST ONE FACTORY!

YOU know how the Studebaker Champion has succeeded in putting every other lowest price car "on the spot" in operating economy, quality and good-looking design.

Now, the longer, lower, wider, roomier new Studebaker Champion for 1941 is doing the same thing in price!

The 2-door and 4-door Studebaker Champion sedans for '41 deliver complete at the factory for less money, including Federal tax, than any other 6 or 8 cylinder sedans in America.

Why not apply for the Studebaker franchise now? It gives you the right to sell Studebaker President and Commander passenger cars as well as Champions—also Studebaker commercial cars and trucks. Address Paul G. Hoffman, President, The Studebaker Corporation, South Bend, Indiana

### ONLY LOWEST PRICE CAR WITH all these features

**Automatic choke** for easier starting in cold weather—prevents stalling.

**Shock-proofed variable ratio steering** that makes parking easier and keeps your Champion on even keel on turns.

**Economatic shift with over-drive** eliminates practically all use of the clutch in shifting—gives you 3 to 5 miles per gallon free. Optional at added cost.

**Angle-set ventilating vanes** provide draft-free ventilation, keep out rain, snow, sleet.

**Planar independent suspension**—self-stabilizing—gives most restful ride of any lowest price car.

**Fresh-air Climatizer and windshield defroster** provides a constant supply of fresh, filtered, warm air throughout the car in the coldest weather. Available at slight added cost.

**Harmonizing two-tone interiors and exteriors** for utmost luxury and smartness at low extra cost.

**Oversize luggage compartment** that's spacious enough for the entire family's traveling equipment.

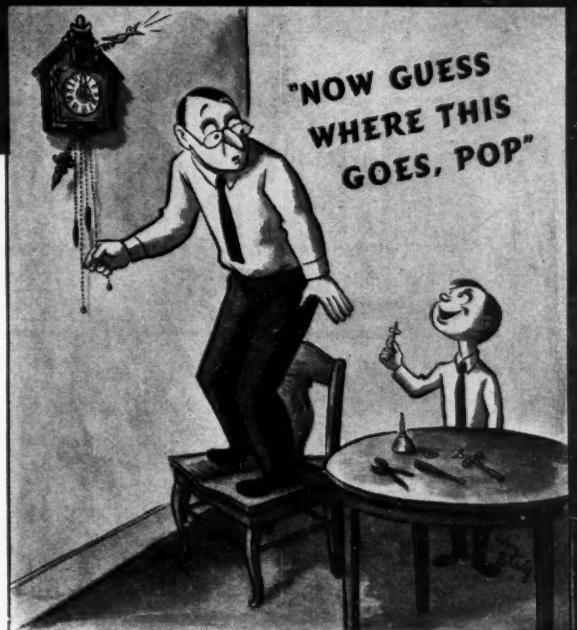
**AND BESIDES, YOU GET—** Glove compartment lock . . . Front-seat ash tray . . . Automatic hood lock . . . Finest hydraulic shock absorbers . . . Non-slam door latches . . . Foot-regulated hydraulic brakes . . . Steering wheel gear shift . . . all standard . . . Automatic hill holder extra.

## **Motor Car Price, Weight and Body Table**

**Following are delivered prices at factory for cars with standard equipment and include all federal taxes with exception of Buick, Ford, Lincoln-Zephyr, Mercury and Willys. Optional equipment, state or local taxes, transportation charges and finance charges are extra.**

# GUESSWORK COSTS DOUGH!

Play safe with  
**McQUAY-NORRIS**  
ALTINIZED  
**Engineered Set**  
**PISTON RINGS**



HERE'S no guesswork with these rings because each Engineered Set is specifically designed to do the job right in one make and model of car . . . the right ring for the right groove of the right piston. That's why repairmen everywhere again this year are increasing profits and sales and making satisfied customers with this popular McQuay-Norris product. And Engineered Set Piston Rings are the only rings that are *Altinized* to assure minimum wear and long life. Blueprint instructions for *precision-installation* come with each Set.

## A NEW SALES OPPORTUNITY

For the First Time!

THE 3 MOST VITAL PARTS IN THE  
CONTROL OF OIL . . . 1 PACKAGE . . .  
1 STOCK NUMBER . . . LOWER PRICES

1 ALTINIZED *Engineered Set* PISTON RINGS  
2 SPECIAL UNDERSIZE, TRIPLE ALTINIZED CON ROD BEARINGS  
3 ENGINEERED PISTON EXPANDERS



For use in Fords and  
Plymouths where  
the crankshafts  
have not been re-  
ground or refinished.

**McQUAY-NORRIS MANUFACTURING CO.**  
St. Louis, Mo.

# PROFIT MAKERS

PARTS • EQUIPMENT • TOOLS • ACCESSORIES

## Goodrich Presents

### New Anti-Freeze

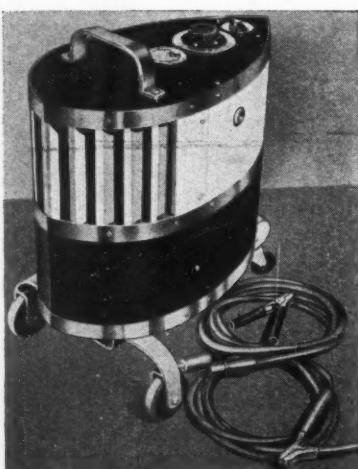


The B. F. Goodrich Co., Akron, Ohio, has announced a new ethylene glycol anti-freeze to be known as "Stet." It is of the permanent type, odorless, will not evaporate or boil away, and contains inhibitors to

prevent rusting. The manufacturer states that "Stet" will not damage car finish, and that it mixes readily with other ethylene glycol anti-freezes and can be tested with the standard hydrometers for such fluids.

### New Quick-Service Charger

The Hunter-Hartman Corp., 2669 Washington Blvd., St. Louis, Mo., has added to its line of Kwikurent Rapid Battery Analyzer and Chargers, a competitively priced rectifier to be known as the "Bullet." The rectifier plates or stacks are made of copper sulphide. The transformer is extra heavy duty and built to give an even



and regulated flow of current. It is equipped with a regulator which permits a graduated range of voltage to protect the rectifier itself and to adjust the current on each and every battery. The rectifier also has a timing switch to shut off the current and the entire machine at the end of a 30-minute operation. It operates on 110 volt, 60 cycle AC current.

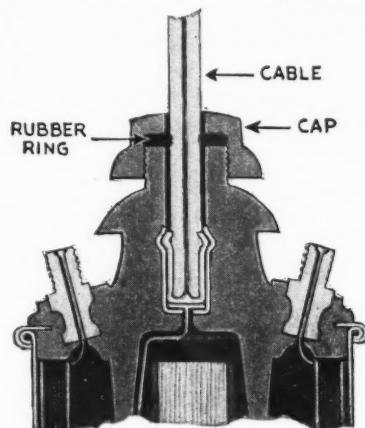


### Spark Plug Cleaner And Tester Offered

A single unit spark plug cleaner and tester has been developed by Bowes "Seal Fast" Corp., 228 N. Pine St., Indianapolis, Ind. The unit is a combined sales and service set-up, including an attractive and roomy display cabinet, convenient work bench with drawer. The tester is made without mirrors so the motorist can look directly into the firing chamber and see the actual sparking at the points of the plugs. The cleaner is efficiently designed to insure smooth operation without clogging. The entire Service Unit, both cleaner and tester, operates on a single airline.

### Coil Has New Top

Standard Motor Products Co., Inc., Long Island City, New York, has announced a new "Blue Streak" ignition coil with "Triple-Protection Top." This novel construction is said to reduce coil failures due to moisture or water on the coil top, high tension leakage and flash-over from the high tension socket to the primary terminals, and loosening of the high tension cable in the socket. The high tension

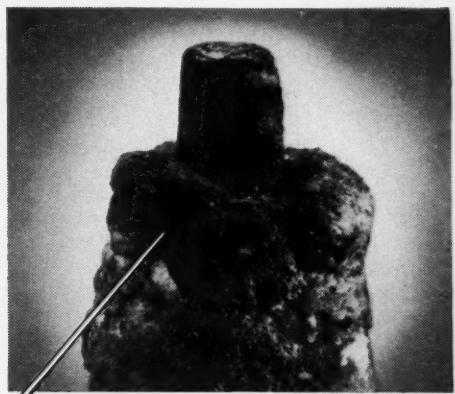


cable is pushed through the cap and the rubber ring, and then goes into the high tension socket. The cap is then screwed down onto the top proper, compressing the rubber ring around the cable in a tight, waterproof seal.



"Now I know what we forgot—the gas pumps!"

# GRIME *does not pay!*



*Wanted for Grand Larceny—OXIDE COATING, alias "DIRTY PLUG." Robbed millions of motorists of millions of gallons of fuel in 1940. This thief may be in your engine now.*

## — but Plug Cleaning DOES PAY



**Stock and Sell the  
Plugs that LEAD  
in Equipment and  
Demand**

AC national advertising in November is telling more than 40 million people to visit Registered AC Cleaning Stations for cold weather plug cleaning. "Cleenie the Plug" is doing the telling in the eye-catching cartoon shown above.

Here is a sure-fire finish to the biggest year AC Cleaning Stations ever had! To get your share of this tune-up business, suggest plug cleaning to every customer who leaves his car for service.

### Here's How You CASH IN on AC Advertising



**DISPLAY**  
*this Nationally Advertised*  
**SIGN**



**Suggest  
CLEANING**  
*to every customer  
who leaves his car*



**CLEAN  
and REGAP  
plugs at  
5c EACH**



**SELL  
2 New Plugs  
for every 6 cleaned\***

\*National Average

AC SPARK PLUG DIVISION • General Motors Corporation • FLINT, MICHIGAN

MOTOR AGE, November, 1940

*When writing to advertisers please mention Motor Age*

# AUTOMOTIVE MEN

**Joseph W. Frazer**, president and general manager of Willys-Overland Motors, Inc., has announced the appointment of **Delmar G. Roos** to the board of directors of that company. Roos joined Willys-Overland Motors, Inc., in February, 1938. He is a past president of the Society of Automotive Engineers. He came to Willys-Overland from Humber, Hillman, Talbot, Sunbeam, Ltd., England, where

he developed cars of great gasoline and oil economy. Previous to his English experience, Roos was associated with the Studebaker Corporation.

Officials of The Timken Roller Bearing have announced the appointment of **George W. Curtis** as the Milwaukee division manager. Industrial and automotive bearings sales as well as alloy steel sales activities of this division will be under his supervision.



**Gordon W. Mixon**, appointed general sales manager of the National Battery Co., according to a late announcement by **Herbert King**, vice-president in charge of sales.

*More Shop Work  
in Less Time*

*..with this handy  
Kellogg Portable One-End Lift*

#### NO INSTALLATION NEEDED

Just roll this Kellogg Portable Lift under axle of car and turn on the air. Up goes end of car (front or rear) to desired height, as much as 56". Safety lock supports load automatically. As simple as that, yet you do jobs quicker—lubrication, brake service, washing, inspection, repairs. Customers like the speedier service; they bring you more jobs. Not expensive, but a money-maker for owners.

**MAKE PROFITS GROW WITH  
THE HARDIE-KELLOGG CAR  
WASHER**—Less time, yes—and less labor, less material. Washing jobs cost you less; your profit increases.

Throws hot water or solutions at high pressure. Cleans worst grease or mud accumulations in a jiffy. Harmless to finish. It's making money for others. It will for you.

**Sales Offices:** 332 S. Michigan Ave., Chicago, Ill.; 230 Park Avenue, New York, N. Y.; 3355 East Slawson Ave., Los Angeles, Calif.; 4785 First Ave., South, Seattle, Washington; Niagara Falls, Ont., Canada.

**KELLOGG DIVISION OF THE AMERICAN BRAKE  
SHOE & FOUNDRY CO., ROCHESTER, N.Y.**

**KELLOGG**  
AIR COMPRESSORS  
LIFTS • CAR WASHERS

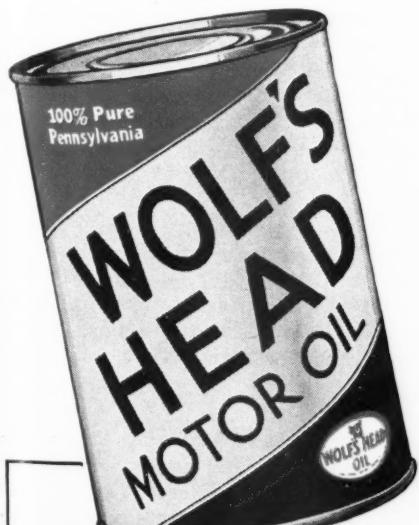
**J. E. Adams**, sales manager of the Toledo Steel Products Co., has announced the appointment of **Herbert M. Wertz** to have charge of the company's advertising. Wertz is widely known in the automotive industry having been connected for a number of years with the industrial division of the De Vilbiss Company of Toledo.

**Earl C. Chatfield**, for nearly 15 years a member of the sales staff of Wilkening Manufacturing Co., maker of Pedrick Piston Rings, and for the past seven years manager of the Replacement Division, has taken over management of the company's Mid-Western Division, with headquarters in Chicago. **Ray Cooper**, who managed the Mid-West territory for Pedrick during 1940, has been placed in charge of special Wilkening activities in the West. He will continue to reside in Chicago. At Philadelphia headquarters, **William E. Wilkening** has been promoted to the position of sales manager of the Pedrick Replacement Division. In the South, **Ralph K. Knepper** has rejoined the Pedrick sales staff as assistant to Division-Manager **Carl Henry**.

Announcement of three new sales managers is made by the Finishes Division of E. I. du Pont de Nemours & Co. **J. L. Masterson**, formerly Western refinishing sales manager located in Chicago, has been appointed regional manager of a newly organized southwestern sales office in Dallas, Tex. **H. R. Lounsbury**, formerly manager of eastern refinishing sales, has replaced Masterson in Chicago. **G. F. Baldwin**, formerly manager of refinishing sales in the Southwest, has been made manager of Refinishing Sales in the Eastern Territory with headquarters at Philadelphia, Pa.



**It isn't the cost  
it's the upkeep**



P. G. C. O. Ass'n Permit No. 19

**H**HELP your customers keep upkeep down! Use and recommend Wolf's Head Winter Oil. Because it starts to flow as soon as the engine turns over, no matter how low the temperature, it prevents excessive wear in cold engines. And Wolf's Head Winter Oils afford this cold weather protection without any sacrifice of stability or lubricating qualities required to meet the high inside-the-engine temperatures after the warming-up period.

The particular quality of Wolf's Head makes such a vast difference in the upkeep of an automobile that *Wolf's Head can guarantee the car*

**100% PENNSYLVANIA  
35c A QUART**

*buyer against bills on lubricated parts during the first 30,000 miles.*

As an aid in closing new car sales . . . and in bringing customers back for *regular service* . . . there has never before been a plan so effective as the Wolf's Head Guarantee Plan.

No matter what make of car you sell, be sure to give your customers (and yourself) the benefit of the Wolf's Head Guarantee. Wolverine-Empire Refining Company, Oil City, Pa.; New York, N. Y.

**WOLF'S HEAD**  
*Winter*  
**MOTOR OILS AND LUBES**

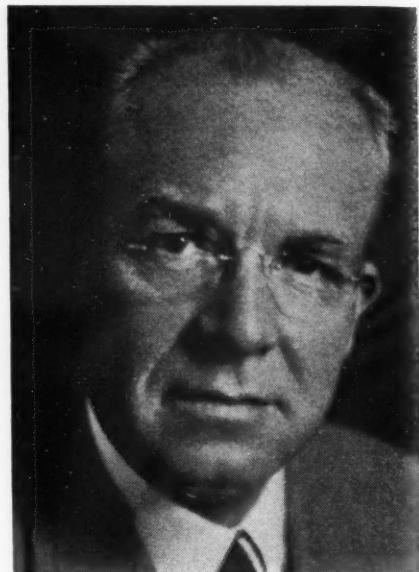
## AUTOMOTIVE MEN

**A. J. Valentine** has been appointed manager of the automobile department of The Crosley Distributing Corp. of Cincinnati, Guy Flraig, branch manager, announced last month.

**Dr. Claude L. Clark**, formerly of the Department of Engineering Research of the University of Michigan, has joined the metallurgical staff of the Steel and Tube Division of The Timken Roller Bearing Co. at Canton, Ohio, as Metallurgical Development Engineer.

**Robert F. Black**, president of The White Motor Co., Cleveland, has announced the election of **Fred T. Macrae, Jr.**, as executive vice-president, a newly created office in the White organization. For the past five years, Macrae has been vice-president in charge of production.

**Harold B. Thomas**, one of the founders of the Elastic Stop Nut Corp., Union, New Jersey, and vice-president in charge of sales, has resigned to enter consulting work in industrial product analysis and market research. He remains active as a director and member of the executive committee of the corporation.



Recently elected vice-president, The Electric Storage Battery Co., S. W. Ralph assumes his new duties at the home office in Philadelphia.

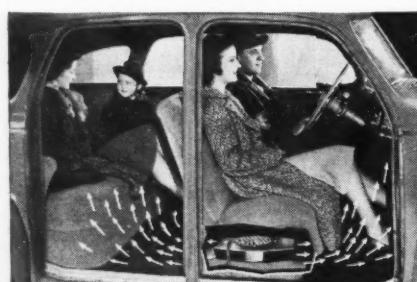
**MOMMY-WHY IS THIS CAR WARMER THAN OUR OTHER ONE...**

**BECAUSE DEAR-THIS CAR HAS A HāDees HEATER!**

## *Nothing is Hotter than* **HāDees CAR HEATERS**

When a car owner invests his money in a heater these days, he expects to get heat . . . plenty of it . . . and fast! Why risk the loss of his goodwill by selling him something that may not deliver the goods? Hook up with HāDees . . . the heaters that sell easily on the strength of their past performance records and install more quickly because of their unique construction. You'll never have to make excuses for any HāDees, whether it be the Model C-130 at only \$9.95 or the elaborate Model H-502 at \$21.95. And another thing . . . the HāDees 1941 proposition is a mighty profitable one, too. Write today for facts.

**LIBERTY FOUNDRIES CO., ROCKFORD, ILL., Division of Burd Piston Ring Company**



### **Let the 1941 UNDERSEAT MODEL Pep Up Sales**

Here's "just what the doctor ordered" to get attention and put new profits in your heater sales . . . **UNDERSEAT Heaters by HāDees**. They're popularly priced and fit old as well as new cars.

**Look to HāDees**  
FOR THE LATEST IN FULL-CAR COMFORT

**Frank T. Tucker**, manager of B. F. Goodrich Co. tire advertising since 1932, has been named director of advertising of the company, it is announced by President John L. Collyer. The new Goodrich advertising executive succeeds P. C. Henderson, director of advertising since 1931, who has resigned to engage in general advertising work, but will remain in Akron for several weeks in a consultant capacity. Henderson is a director of both the Association of National Advertisers and the Advertising Federation of America.

**President M. M. Gilman**, of the Packard Motor Car Co., has announced the first major administrative change in preparation for the Packard-Rolls Royce plane engine program. **J. H. Marks**, purchasing manager of Packard since 1925, is elevated to the position of vice-president in charge of procurement, machinery and accessories in connection with the Rolls Royce plane engine project. In addition Marks will supervise the erection of new buildings and other details growing out of the expanding war plane motor contract.

**Louis Bloom**, who has been identified with prominent automotive lines for the past 25 years, has been appointed general sales manager of the Supco Products Corp., manufacturers of brake parts and brake fluid, New York.

**Gilbert L. Wolfe** has been appointed representative of the American Nickeloid Co. of Peru, Ill., to have charge of their Schenectady, N. Y., office and to cover central New York state for their pre-finished metals.

# "BEST INVESTMENT IN 20 YEARS!"

says LEO E. SCHIRBER  
of the  
**Mobridge Auto Company,**  
**Mobridge, South Dakota**

"IN 20 YEARS, we have spent thousands of dollars on equipment and sales helps. But we feel that our investment last year in modernizing our lubrication department is the most profitable we ever made!

"Checking over our records — we find that they show an increase of 42% in oil and grease sales...an advance of 60% in lube jobs over the last eight months. We have also enjoyed a substantial increase in both our service and our parts business.

"We are keeping two extra men busy in our service department . . . largely because of our improvements. Thanks again to Socony-Vacuum's swell Car Dealer Service Plan."



## HERE'S THE COMPLETE PRACTICAL PLAN SOCONY-VACUUM OFFERS YOU!

★ **REVIEW OF YOUR LUBRICATION DEPARTMENT.** Trained men survey your present set-up... suggest ways to develop its profit possibilities.

★ **REVIEW OF YOUR MARKET POSSIBILITIES.** A careful study helps us to calculate the future growth of your business — to determine the size and type lubricitorium you need.

★ **ADVICE ON LAYOUT AND EQUIPMENT.** We don't sell equipment—but our years of experience will help you select the type of equipment and layout you need to get new customers.

★ **HARD-HITTING SALES PROMOTION PIECES.** Our dealer aids—folders, reminder cards, etc.—are designed and prepared to help push your service specials.

★ **TRAINING FOR YOUR MEN.** Our experienced experts train your men—coach them in selling—with movies, manuals, and charts.

And we don't stop there! Our experts keep on helping you as business increases . . . profits jump. That's why car dealers the country over say: "Socony-Vacuum's Plan starts where others leave off."

ADDRESS THE CAR DEALER DIVISION — SOCONY-VACUUM OIL COMPANY, INC., 26 BROADWAY, NEW YORK CITY

**BEGINS WHERE OTHERS LEAVE OFF.**  
**Socony-Vacuum's Car Dealer Service Plan**

# LEGALLY SPEAKING

by C. R. ROSENBERG, JR.

**A lawyer's interpretation of Federal and local court decisions of interest to repairmen, presented each month**

## "Severable" Sales

ORDINARILY, when a party to a contract defaults on one part of a contract he defaults on the whole deal, and the other party may rescind or cancel the contract because of the de-

fault. For example, where a contract provides for installment shipment of goods, a failure to ship one installment as agreed would ordinarily be a "default" on the whole contract.

In an Arkansas contract for install-

ment shipments, however, it was provided that "breach or default of either buyer or seller as to any installment or installments shall not give the other party a right to cancel this contract except as herein otherwise provided."

The buyer under this contract claimed that the first installment shipment was inferior in grade and therefore wanted to get out of the entire deal. But the Arkansas court said no.

"The contract," explained the court, "clearly evinces the intention of the parties to treat each shipment as severable and separable from other installments and specifically provides that a breach or default of either buyer or seller as to any installment shall not give the other party a right to cancel the contract."

That word "severable" in a contract usually means that if one or more parts of the contract should go "sour" the other parts hold good anyhow.

## Loss of Profits

WHEN a business man contracts for certain goods or equipment for his business, he ordinarily suffers a loss of profit if the items are not delivered at the proper time. Can he recover that lost profit by legal action against the person whose failure to deliver in accordance with contract has caused that loss? It all depends on circumstances, according to some recent court decisions.

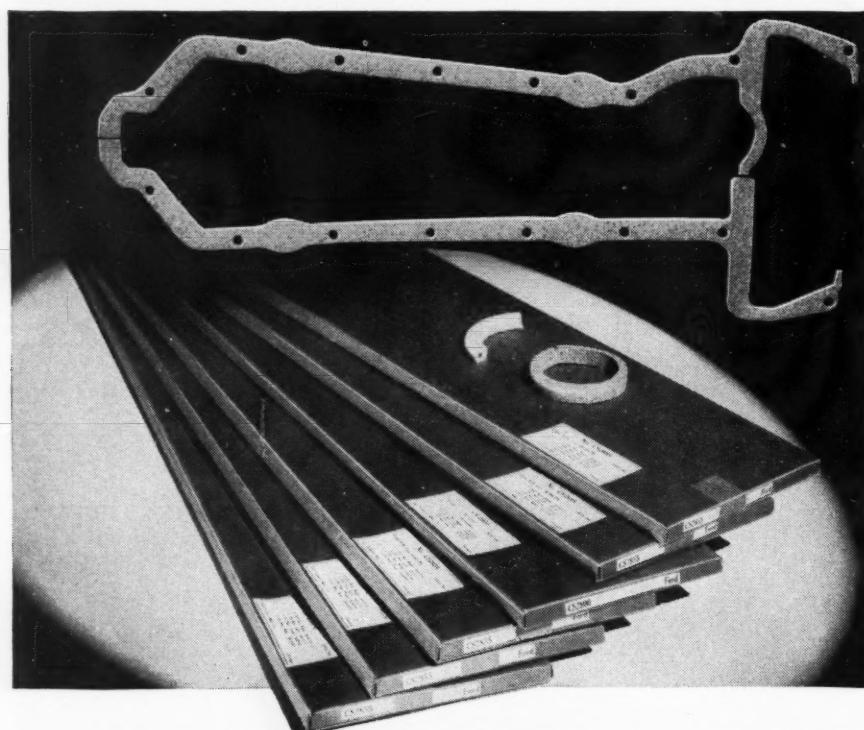
"Where the business is shown to have been already established and making a profit at the time the contract was breached," says a Texas court, "such pre-existing profits, together with other facts and circumstances, may indicate with reasonable certainty the amount of profits lost. In such cases it is permissible to show the amount of business done in corresponding period of time not too remote and the business during the time for which it is sought to recover loss of profits."

A new enterprise may fail entirely or at least be greatly hampered if goods and equipment are not delivered when contracted for. Yet here's what a Washington court decision says in such a case:

"Prospective profits may not be recovered where they are speculative, uncertain and conjectural. In the case referred to, the contract for goods contemplated the establishment of a future business. It did not pertain to any existing business. Any loss of profits would necessarily mean the loss of such anticipated profits as might possibly be earned in the future from a business not yet created, installed or conducted."

So, since the organizer of a new enterprise cannot prove what his profits would have been if he had had the chance to make them, he loses!

(Continued on page 72)



## SHARING THE SPOTLIGHT

With the introduction of the new automobile models for 1941, *Advancement*—the keynote of progress—is again brought into the Spotlight.

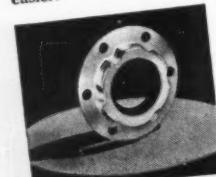
FEL-PRO Gaskets share this Spotlight because of their selection as standard equipment by leading car manufacturers for many of these 1941 models. FEL-PRO Manifold Gaskets, Pump Packing and Grease Retainers, conforming to the latest engineering standards, also meet the highest requirements of modern, high speed car and motor performance. Felt Products Mfg. Co., 1510 W. Carroll Ave., Chicago, Ill.



FEL-PRO Cylinder Head and Manifold Gaskets—Conform to irregular surfaces without distortion.



FEL-PRO Pump Packing—Fits flush at once ... installation faster and easier.



FEL-PRO Grease Retainers—Easily installed ... no special fitting ... accurate on all cars.

**FEL-PRO** *Gaskets*  
PUMP PACKING  
GREASE RETAINERS

When writing to advertisers please mention *Motor Age*

# Every CAR and TRUCK that Goes By Your Door is **A PROSPECT**

FOR AC Speedometer CABLES and KITS



You can get and hold speedometer cable customers who come your way with the AC line of packaged replacement Cables and Cable Kits. Millions are sold every year.

AC Cables and Kits cover the volume market. Even more important, AC Cables and Kits give you and your customers the certainty of top quality and reliability, because that's what the AC trade-mark stands for. That means,—precision workmanship, correct materials, correct engineering.

Seven factory-assembled Cables cover all Chevrolets, 3 cover all Fords from 1931 to 1939, and 4 cover all Plymouths from 1934 to 1939. Two Cable Kits give almost 100% coverage of all cars—and most popular makes of trucks.

## AVAILABLE From All AC WHOLESAVERS

Factory-Assembled CABLES of the exact length required, complete and ready for use, are packed individually in attractive display cartons.

Installing these factory-assembled cables is simply a matter of removing the old cable and replacing with the new one. **ONLY 85¢ RETAIL.**

## 2 CABLE KITS

For practically all vehicles. Each kit contains one cable (with one end finished ready for use); assorted drive tips for assembly on other end of cable; and "quick action" staking tool for making this assembly.

Installing these cables requires only that the dealer cut the new cable to the same length as that of the old. The staking operation requires only a minute to complete. **ONLY \$1.00 RETAIL.**

## STOCK AND SELL AC CABLES

**Quality Materials — Workmanship — Performance**

AC SPARK PLUG DIVISION • General Motors Corporation • FLINT, MICHIGAN

## Legally Speaking

(Continued from page 70)

### Refusal to Pay

THERE'S no doubt that unfair advantage is often taken in business transactions of legal devices intended for helpful and constructive purposes. One of these is the so-called accord and satisfaction. Where debtor and creditor have an honest disagreement as to the amount due, they may by negotiation reach an "accord" on the amount to be paid, and when the debtor has paid it, the creditor is said to have obtained "satisfaction." In

plain language, it's a compromise settlement.

But quite different was the purported accord and satisfaction in a recent Federal case!

"The defendant has failed to establish an accord and satisfaction," said the court. "The sum owing by the defendant was definite, certain and undisputed. The agreement between the parties was clear and unambiguous. It is elementary that a deliberate refusal to pay one's debts cannot create a dispute as a basis for an accord and satisfaction. There was not even an honest doubt as to the amount due under the contract. The evidence re-

flects an attempt by the defendant to persuade the plaintiff into a settlement and accord, but the plaintiff at all times refused and declined to accede."

That business of "refusing and declining to accede" is a pretty good idea for a repairman whose debtor is trying to settle an account for less than he owes—when there's no honest dispute about it!

### Loss of Contract

UNLESS a repairman is willing to lose whatever advantages he has under a contract, he had better move carefully in trying for better terms under the contract. If he "asks for it," the courts will give him no relief.

"The dealer became dissatisfied with his contracts with the manufacturing company," said the court in a recent case, "and negotiated with a major competitor of the company for more favorable ones. Upon their procurement he demanded like terms from the company and stated that unless they were granted he desired to abrogate existing contracts with the company. He refused to pay his account until his demands were met, and as a result his account became past due and his dealer's contract subject to cancellation on five days' notice.

The company refused his demands, and, in accordance with his expressed desire, served the required notice preliminary to the cancellation of the contracts. The court fails to see where the cancellation of the contracts in accordance with their very terms can operate to create a liability against the company."

A contract must be viewed as a whole. A repairman who "crowds" one clause of a contract is apt to set in motion other clauses that will give the other fellow an "out."

### "What Did You Lose?"

Where a repairman is a party to a contract which is breached or defaulted on by the other party, how is the compensation or "damage" due him computed?

According to a recent Texas case, he is entitled to recover what he lost through the other man's breach or default. Carrying the legal reasoning a step further, his loss amounts to what he would have received if the other man had faithfully performed under the terms of the contract.

"The fundamental rule in assessing damages is compensation," says the Texas court. "In case of breach of contract the value of performance to the aggrieved party is the fundamental issue."

In other words, he is to be compensated for what he would have gotten out of the contract if it had been carried through. But he must be ready with facts and figures to show what that would have been.

Cut Repair Time 25% to 40%!

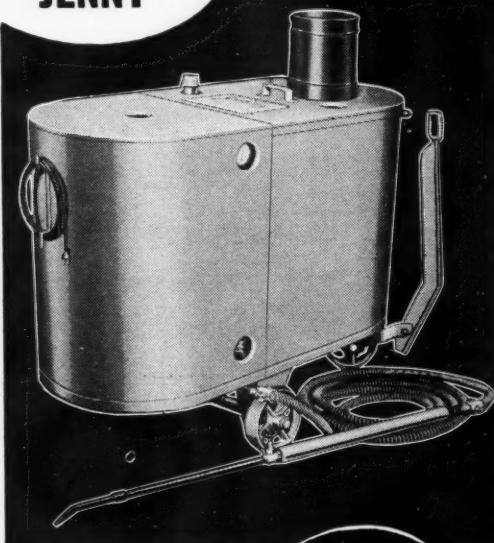
Get \$15 to \$50 More for Used Cars!

Create New Profit-Service Jobs!

with

HYPRESSURE  
JENNY

YES, Hypsure Jenny Steam Cleaning does all these things for car dealers and independent repair shops. Steam Cleaning, before repairs, actually saves 15 to 25 minutes out of every man-hour on repair work! Used cars with motor, chassis, and under-gear Jenny-cleaned to new car appearance, bring surprisingly higher prices. Engine and chassis cleaning jobs, sold with lubes and washes, get you tidy extra profits! A free survey will tell you how much Jenny can make for you! Mail the coupon NOW.



**HOMESTEAD VALVE MFG. CO.**  
P. O. BOX 95

CORAOPOLIS, PA.

SEND FOR THIS  
FREE SURVEY  
TODAY!

O. K.—Send that Survey.

We recondition, repaint, repair.....cars or trucks monthly.

We employ.....mechanics on dirty, greasy repair work.

NAME.....

ADDRESS.....

SURVEY

# No Rolling OFF U.S. TAILOR-MADE LIFTS



## EXTRA U. S. FEATURES AT NO EXTRA COST

The instant a car is driven on a U. S. "Tailor Made" full hydraulic drive-on lift it is "stopped dead" in its tracks, no rolling because it is held in position by low, positive safety ridges on all four ends of runways. No need to bother about whether or not customer puts on the brakes before leaving car, it will stay "put" on a U. S. Lift until automatic chocks come into action when the lift is raised. Only lift equipped with safety ridges. Safety to motorist, attendant and the car. • This combined with many other exclusive U. S. features such as 4 automatic chocks, narrow cross members, greater accessibility and visibility go to make U. S. Lifts the top favorite of the majors and independents alike. • Before buying a lift send for a free U. S. lift catalog and compare them with any lift on the market.



SAFETY RIDGES AND AUTO.  
MATIC CHOCKS ON ALL  
FOUR ENDS

SEE U. S. EQUIPMENT AT THE FIRST  
EXHIBIT SPACE, B 2-4-6 AND 8—  
NAVY PIER, CHICAGO, DECEMBER 9-14th

THE UNITED STATES AIR COMPRESSOR COMPANY

Cleveland, Ohio, U.S.A.

AIR COMPRESSORS

GREASING EQUIPMENT

HYDRAULIC LIFTS

## Well Dressed Shop

(Continued from page 37)

help sell its service; get the greatest good out of the showmanship values built into shop equipment, display stands, parts cabinets, tool racks, work benches, backgrounds, and special service kits.

Virtually every piece of shop equipment on the market today has three intrinsic, built-in values: utility, showmanship and earning power. Get the most for your money invested by taking out what the manufacturer has already put in. Then, every manufacturer either packages or dis-

plays (ofttimes he does both) the product or service he sells through you. Millions are invested to ignite the spark that starts the sale for you and that dough is put into good displays so that you can take it out in better sales.

Here are eight pointers to help you display and sell more merchandise and more services to your customers:

1. Nothing creates a better sales impression, arouses more interest, stimulates a greater buying urge—than a well-equipped shop.

2. Know your stuff and show your stuff. Displayed merchandise is sold

more quickly. People seldom buy merchandise they can't or don't see.

3. Take full advantage of the showmanship values built into each product or merchandise display.

4. When you display a product be prepared to follow through with an earnest and intelligent selling job. Tell and sell every potential buyer.

5. And back up your selling effort with a stock of the merchandise you display. The buyer can't take it with him if you can't deliver the goods.

6. Rotate displays to provide variety and greater sales, whether seasonal or otherwise. Farmers rotate crops to produce more abundant yields. You can do the same thing with the merchandise you display, the signs you use, the banners you buy.

7. Remember, while you're busy at something else, the manufacturer's display starts the sale for you.

8. Your jobber's salesman has lots of good ideas. He knows you, your business, your problems, your neighborhood. He'll help you. Ask him, and then make good use of his suggestions.

## You have seen hundreds of clutch plates... but never one like this!

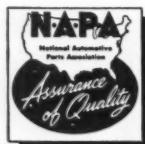


Selling fast and piling up big mileage for pleased customers... the sweetest drive plate ever sold!

• Never before have you installed a clutch plate so perfectly designed to give smooth, easy clutch-action and such lasting customer satisfaction.

The new Monmouth flexible center, suspended on helical springs, smooths out uneven torque. And Monmouth's new and unique cushioning construction provides positive yet velvety clutch engagement without the slightest "grab." *And this cushioning can never mush down during the entire life of the plate.* You've looked for such a plate for years. Now you really have it. And what a driving difference it makes!

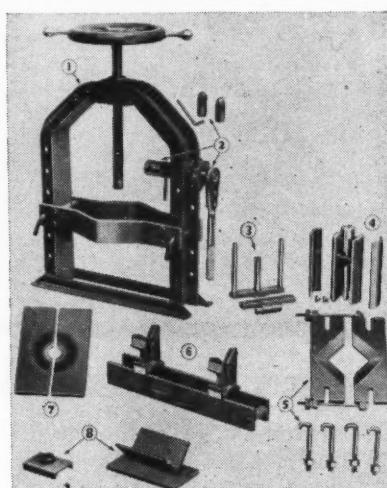
Monmouth Clutch Specialists are getting the big end of the business on this new plate. Specialized knowledge has taught them *when* to say "It's the clutch!" They never fear to take on the job, nor worry how they'll "come out." You, too, can be a Monmouth Clutch Specialist and profit accordingly. For complete details, phone your NAPA jobber, or write us.



Master stocks of Monmouth Clutch Plates and Parts for all cars are maintained in NAPA Warehouses from coast to coast, assisting jobbers in every section of the country to give prompt service even on rarely called for numbers.

For Clutch Service  
**Monmouth**  
*Is the Name!*

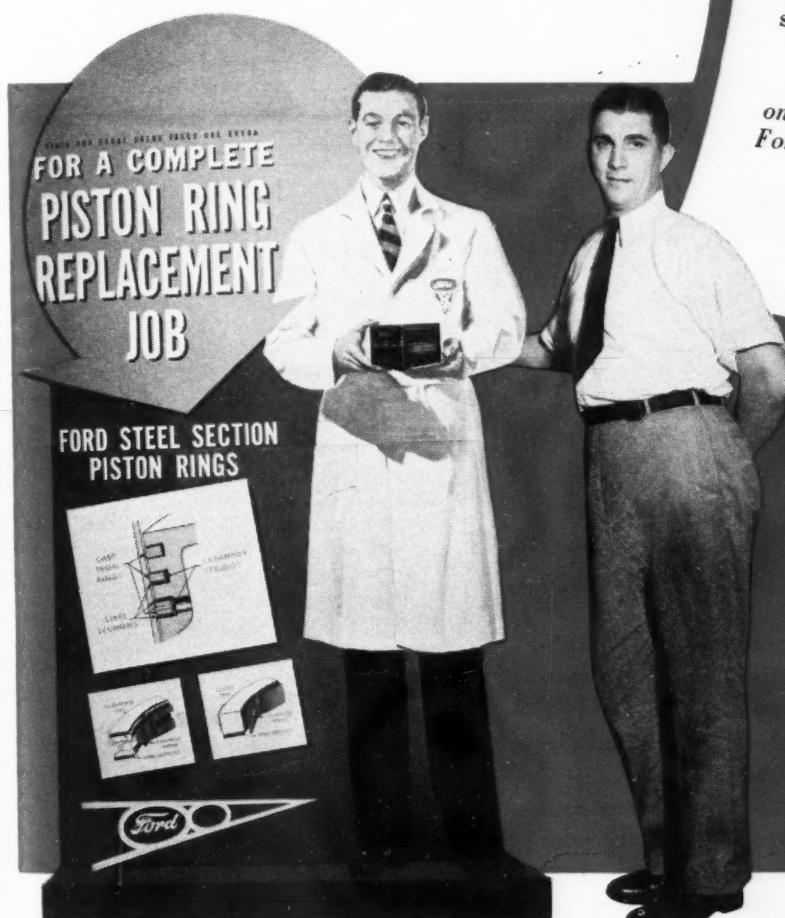
**MONMOUTH PRODUCTS COMPANY, CLEVELAND, OHIO**  
Engine Bearings • Clutch Plates and Clutch Parts • King Bolt Sets



moves bushings from closed end plates, and many other general purpose uses. As illustrated, No. 1 is the Trucut press with adjustable bed; No. 2, pole shoe screw driver and extractor unit; No. 3, the closed end plate bushing extractor and inserter unit; No. 4, the pole shoe expander unit; No. 5, pulley puller plates; No. 6, straightening block with base; No. 7, bearing and gear puller plates; No. 8, V-block vise and clamp. Price complete with all attachments as illustrated, \$75.00.

# Straight from Another Serviceman

• Does it pay to use Ford Steel Section Piston Rings? Well, the question can be answered best by somebody who has tried them. This recommendation comes from M. J. Cooper, Service Manager of Louisville Motors in Louisville, Kentucky, and he speaks as one serviceman to another!



• Genuine Ford Steel Section Piston Rings should be used in worn and tapered cylinders. Rings come in .015 inch, .030 inch, .045 inch and .060 inch oversizes and standard size.

They combine sections of steel, for long wear, with sections of cast iron, for quick seating without damage to cylinders.

*From a letter received by the Ford Motor Company*

"We advertised in local newspapers a complete piston ring job at a special price which still left us a good margin of profit. We featured Ford Steel Section Piston Rings.

"Since the introduction of this Piston Ring special several months ago, we have sold over 500 specials.

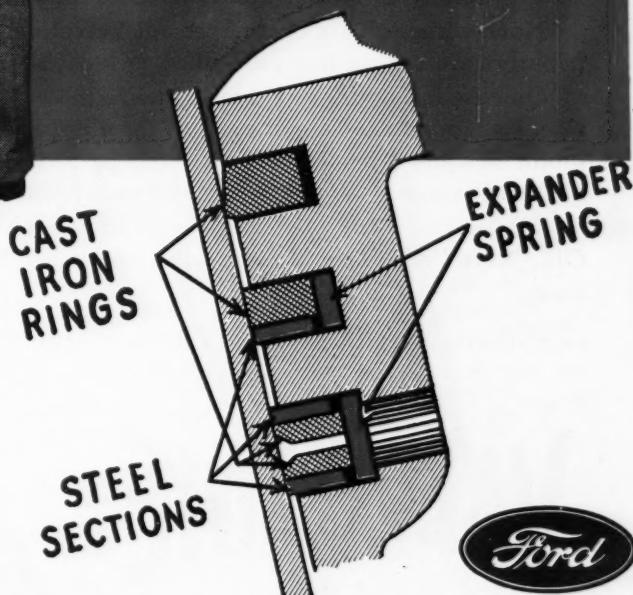
"There has been not one complaint. "Needless to say, we are completely sold on Ford Steel Section Piston Rings and the Ford program for featuring them.

Sincerely yours,

*M. J. Cooper*

Service Manager  
Louisville Motors, Inc."

• You can get full information about Ford Steel Section Piston Rings from your Ford Parts Distributor. **GET IN TOUCH WITH HIM TODAY.**



## FORD MOTOR COMPANY

SERVICE DEPARTMENT  
DEARBORN, MICHIGAN

# COLLECTING BILLS

(Continued from page 27)

such cases telegrams are more effective and cheaper than a long distance phone call or a personal visit.

A letter or telegram—or a personal talk, for that matter—must be slanted to fit the personality of the person who owes you money. About a year ago a vegetable canning concern got into me for almost two hundred dollars. They had had a very bad season and were more than slow about mail-

ing out checks. I knew the manager slightly, and I also knew he had the reputation of being addicted to high stakes at poker. I wrote him a letter something like this:

Dear Mr.\_\_\_\_\_:

If you ever played poker you may recall a strange custom called "Ante-Up." They tell me it's all the same whether you're playing for pennies or millions; you have to "put" if you want to keep in the game. I understand that this ante-up business is also vulgarly known as, "decorating the mahogany," or "feeding the kitty."

My story is short. My mahogany cash drawer needs decorating and a good square meal wouldn't hurt the shop cat. I'm de-

pending on you to "ante-up" so the game can go on.

May your next hand hold a royal flush!  
Yours for bigger and better pots,

It worked. It brought a check by return mail, and the next time I happened to see this man he slapped me on the back and said it was the best collection letter he'd ever received. It was okay for him but it wouldn't have done for an anti-gambling crusader. Here is a sample of a letter I sent to a presiding elder of a church who had a great and vocal love for foreign missions.

My Dear Sir:

I've heard a lot of people say that foreign missions are a worthy institution. I have heard others say that "Charity begins at home." Personally I have an open mind on the subject, but I have a suspicion there is right on both sides.

For instance, I know you have to send checks out of town to pay for your insurance, I know you have to send money orders to your son, David, who is in college. In a way that's like sending money to the foreign missions because the money's leaving town. On the other hand, when you give me a little check for your account on the books it's keeping the money at home. I know you want to strike a fair balance so I'll be expecting one of those "home" checks any day now.

That one worked too. The fact is, I've found it isn't hard to collect bills if you study the approach. Some time ago a local Justice of the Peace got into me for a small amount. At the end of the first month when he was presented with a bill he said there was a mistake, that he had paid cash at the time the work was done. When he was shown his signature on the charge ticket he admitted the debt, but said to wait until the first of the next month. At the end of the third month he still was on the books, so I called at his office.

"I've got a little business for you," I said at once. "I want you to collect a bad account for me. This fellow has owed me for some time and won't pay up. You collect bad accounts, don't you?"

"Certainly," he said eagerly, and reached for a pen and a printed form. "Give me the man's name and address and the amount and I'll see what I can do for you."

"You'll probably have a tough time getting this one," I ventured, "and I'm warning you, he'll try to get out of it."

"I'm used to handling that kind," he boasted, "what did you say the name was?"

When I mentioned his own name his jaw fell open wide enough to drive a tractor through. Then the joke soaked in and he started to laugh, and before he stopped laughing he had a check filled in.

Last summer five of my customers left for vacations up in the mountains, and they left owing me money. I wrote each of them a short note saying that I hoped it was cool up there and that they were having a swell time. I ended by saying that I, too, would like to make a trip but couldn't because so many of my cus-

(Continued on page 78)

• Anticipating the lubricating oil requirements of modern high-speed, high-compression motor cars, Valvoline Research Laboratories improved its oil. That was some time ago.

Now, without blare of trumpets all Valvoline dealers and distributors are selling this oil—tuned to today's needs.

Quietly, in its stride, Valvoline takes these problems as routine. Its laboratories are always on the alert, keeping pace with motor design—maintaining leadership by production of highest quality. It assures safe lubrication for today—and the future.

Why not maintain your sales leadership with Valvoline Motor Oil, "X-18" All-Purpose Gear Lube, and other Valvoline lubricants?

VALVOLINE OIL COMPANY, 540 EAST 5th STREET, CINCINNATI, OHIO  
NEW YORK • CHICAGO • ATLANTA • LOS ANGELES • REFINERY IN PENNSYLVANIA

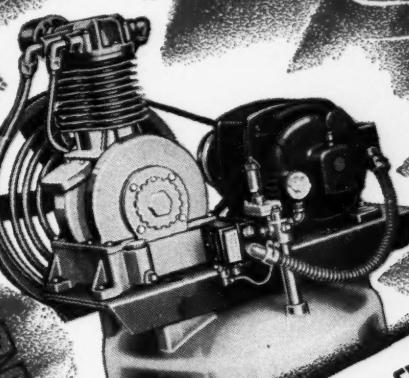
# VALVOLINE

THE ORIGINAL PENNSYLVANIA OIL



# All Your Air Problems Solved

WHEN YOU  
BUY A NEW  
WAYNE



BIGGEST  
VALUES AT  
THE LOWEST  
PRICES EVER  
OFFERED

A COMPLETE SHOWING OF THE FAMOUS 300 SERIES

**WAYNE AIR  
COMPRESSOR**

1891 Wayne 1941

SEND  
FOR THIS  
*Free*  
BOOK!

Backed by Wayne's Nation-Wide Service

YOUR copy of this beautiful new presentation of Wayne's money-making and money-saving Air Compressors is waiting for you! There's a type and size for every need in the complete Wayne line. Learn about the new improvements and refinements which assure operating costs lower than ever! Buying a Wayne is a guarantee of uninterrupted operation because Wayne's nation-wide pump service organization is back of every Wayne Compressor. End your air troubles by buying a Wayne now!

**MAIL COUPON FOR YOUR COPY!**

THE WAYNE PUMP COMPANY  
Please send us your new catalog showing the COMPLETE Wayne Air Compressor  
line. We use air for .....  
NAME .....  
ADDRESS .....  
CITY .....  
STATE .....  
FORT WAYNE, IND.

## Collecting Bills

(Continued from page 76)

tomers had left town owing money. Four of the five sent me checks within ten days, and the fifth came to the shop and paid off in cash as soon as he got back.

When I hit a man up in his office I don't get stiff about it and say, "I've come to collect the bill you owe me," or "Is there any chance of getting a check today?" Instead I go right up and sit on the edge of his desk and say something like this with a grin on my face: "A fellow down

the street just told me that you pulled my name out of the pot," or, "I had a dream last night that you were holding bank night in here this afternoon, and I didn't want to be left out." To another I might say, "You've got a kind face; I know you want to help the poor." Maybe you don't think much of these approaches but I'm telling you they work!

I collected another old account in a very simple manner. Knowing that this man had a lot of pride I sent him a statement the fourth month, and on the bottom I wrote "PAID and Charged To Charity." The next morning he came puffing in with a

check in his hand. "I want you to know I don't need charity," he snorted. "Now give me another receipt without that charity business on it." If it made him sore he didn't stay sore long.

Still another fellow ignored my statements for three months in a row. On the fourth statement I purposely doubled the amount he actually owed me. That brought immediate results. He called on the phone and he was excited plenty. "I've just mailed you a check for \$22," he shouted, "you sent me a bill for \$44 but \$22 is all I owe and it's all you're going to get." "Sorry," I told him, "if you say it's only \$22 it's okay with me—I guess the bookkeeper made a mistake."

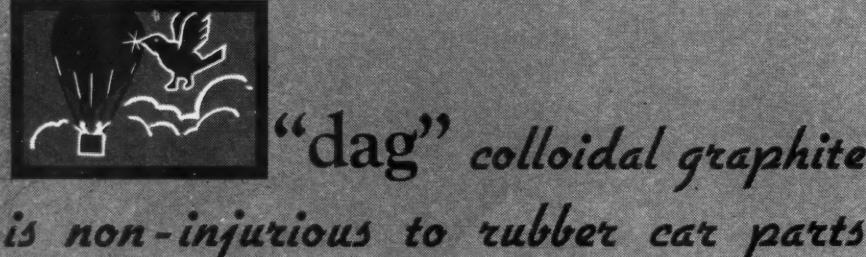
And those are just a few of the collection methods that have been doing a job for me. I heard rumors that one concern who owed me thirty dollars were about to go on the rocks, so I hurried around and took it out in merchandise that I could use—at wholesale prices. If I hadn't got busy on that one I wouldn't be able to say my credit losses have been held down to twenty-seven cents per thousand dollars of volume. I collected two-thirds of what that fellow owed me, but he got out of town before I had a chance to get the other third. But I haven't given up hope yet, he may come back some time and then I'll get it. Want to bet on it?

## Driving and Passing Lights Use "Glaseal" System

Equipped with Mazda All-glass No. 4010 and Mazda No. 4011 sealed beam lamps, the new driving and passing lights announced by U-AD-CO Automotive Devices Co., 1018 South Wabash Ave., Chicago, Ill., provide increased visibility for night driving to



those cars not equipped with the new sealed beam headlights. These lights are supplied with universal adjustment brackets for installation on any car, and are equipped with theft-proof nuts and bolts. Lights are finished in bright nickel chrome shell. Price in matched sets, \$11.00; individual lights, \$5.50 each.



Use a rubber lube containing "dag" colloidal graphite on those squeaky shackles, engine mountings — any rubber part that is giving "Birdies" trouble. It is harmless to rubber and will stop the "comebacks."

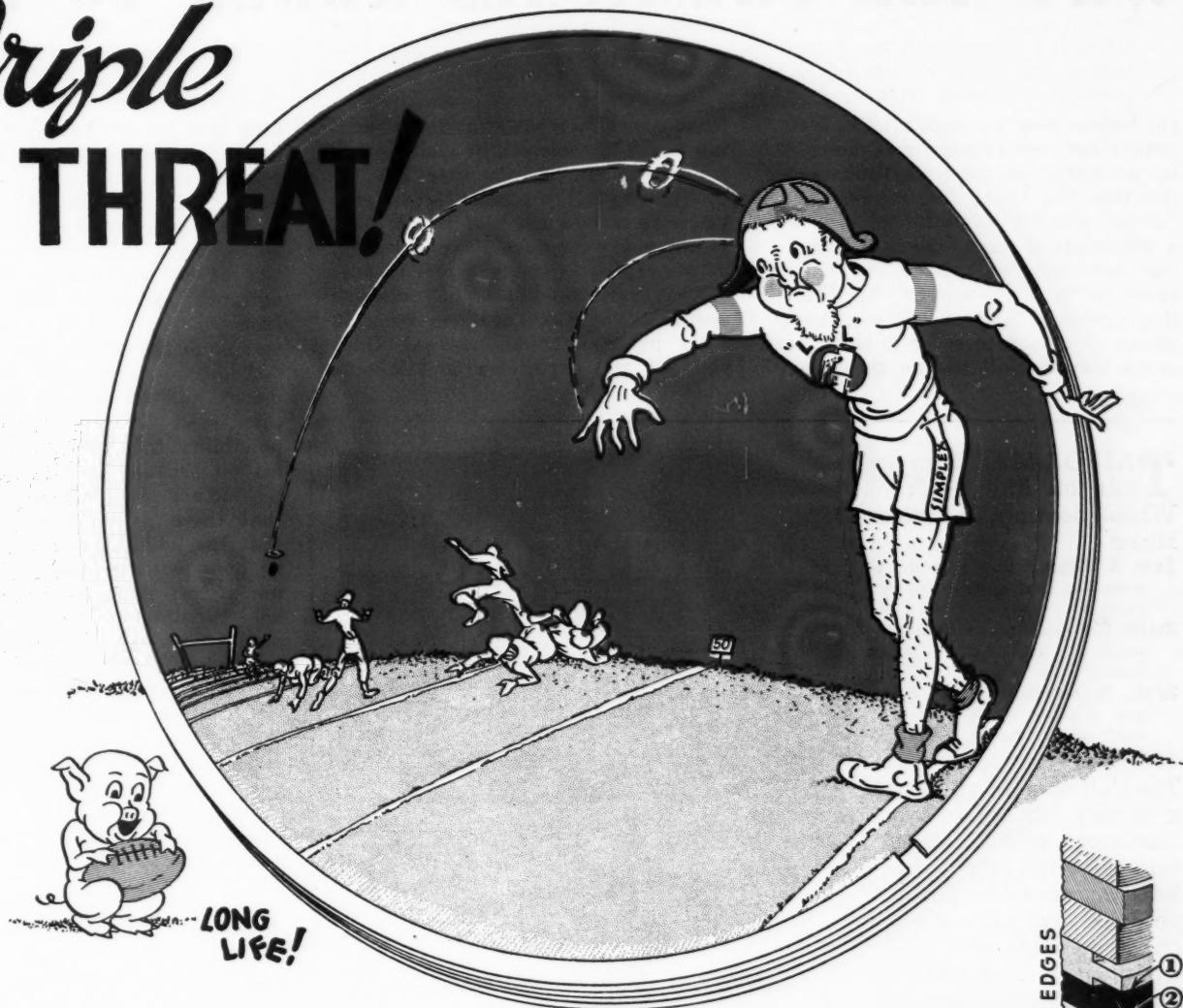
Acheson worked out the formulas which have been patented with "dag" colloidal graphite as the basic part. Its minute particle size makes quick penetration sure. And the presence of the solid lubricant keeps the squeaks away longer. Any gun giving a needle stream may be used to apply these rubber lubricants — they are NON-POISONOUS, NON-INFLAMMABLE, and WILL NOT ATTACK CAR FINISHES.

Selected marketers blend and package "dag" colloidal graphite rubber lubricants under their own trade-marks. We will gladly supply the addresses of several such companies. Send for folder.

**ACHESON COLLOIDS CORPORATION**  
PORT HURON



# Triple THREAT!



**R**UN—pass—or kick, there's no substitute for the razzle-dazzle performance of Simplex "LL"s. Tackle any scrub or regular—oil pumper or puddle jumper and this remarkable Simplex reconditioning ring will make 'em run again like only "LL" can. No compression passes into the open when "LL" is in the line-up; no scoring of cylinders—no piling-up of carbon.

Don't sit on the sideline and watch your opposition score touchdown after touchdown behind this great star of the service gridiron. Put "LL" in *your own* lineup and throw the "tough guys" for a loss.

Get into a huddle today with your nearby Simplex Distributor.



For quicker seating and longer life, segments of different degrees of hardness are alternated in the groove. The softer, deeper segments wear down while the ring is seating, protecting the cylinder wall. The tougher, hardened sections carry-on after the seating, for long life.

**SIMPLEX PRODUCTS CORP.**  
3820 KELLEY AVENUE • • • CLEVELAND, OHIO



# WHY ARE CHEMICALS ADDED TO OIL?

(Continued from page 38)

cal names was an unprofitable occupation for the average mechanic, so he promptly baptized any substance put into the oil by the refiner as a "dope," and he didn't intend it to be a disparaging term. Oil men speaking generally of "dopes" refer to them as "additive agents" or "addition agents." And all oil men have plenty of reason to refer to them because they are all testing them con-

tinuously, either with an idea of adding them to their oil, or changing or adding to the agents they are already using. If you must have a wild guess as to how much of the oil used in automotive engines today is treated, 50 per cent is as good a figure as any.

The various kinds of additive agents might cost anywhere from 50 cents per gal. to \$5 per gal. Once you get the experience and labora-

tory history so that you can determine if a certain agent is desirable for a certain type of oil, it is not very hard to add. Usually it is diluted in, say, a 5-gal. lot of oil and then the whole 5 gal. is dumped into a quantity of oil where it is mechanically agitated. Additives may consist of from  $\frac{1}{2}$  per cent to 2 per cent by volume of the oil you buy.

Additives cost the refiner real money and, so far, he has absorbed their cost. There seems to be little possibility that he can get more for his oil because he uses them. Some technicians who use additives think that there probably is not a thing that the additives do that could not be done with more or precise refining, if cost were not a factor. Others hold the opinion that with no known method of refining, irrespective of cost, could characteristics be put into any oil that are not present in the crude. Regardless of point of view, getting the result is the thing that interests the oil producer, and if he can get it more cheaply by introducing some outside substance into the oil rather than by further refining, you get treated oil which is to your benefit.

The oil technician knows all the properties and characteristics of his particular oil. Armed with this knowledge he experiments endlessly with specific additives for specific reasons. When he satisfies himself that he has accomplished his purpose with a certain additive, he then runs endless tests to make sure that the additive while it helps in one direction does not do harm in another. Another thing he must look out for is the effect of the additive under varying conditions of operation. When he is all finished he might be completely satisfied with the additive for his oil. He would not recommend it for any other oil without going through the whole routine of testing again.

The average test is made in a small single-cylinder engine under conditions controlled to simulate severe operating conditions. If the lubricant being tested looks like a winner it is probably advanced to a full scale engine where it is tested in an engine such as is found in any of the passenger cars of today. Here again the conditions of operation are designed to give the lubricant a good workout.

So far so good, but what are the specific reasons for treating lubricating oil? They are:

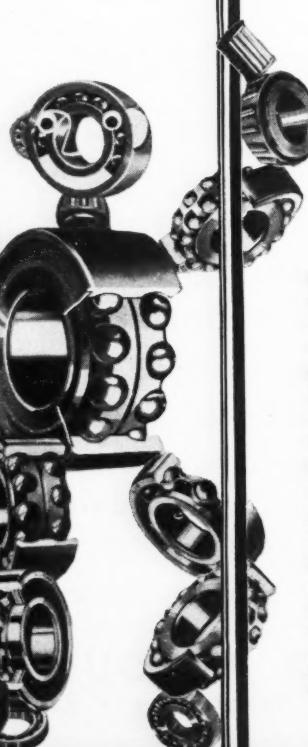
1. To reduce corrosion of engine parts;
2. To increase stability of the oil;
3. To act as a detergent in the oil;

**TAILOR-MADE** for its job, this Ahlberg Front Wheel Bearing Unit combines:

- 1st: A display that commands attention and sells bearing service;
- 2nd: An ideal piece of equipment for quick, clean, easy jobs;
- 3rd: A salesman that shows you a profit on a compact stock of fast-moving replacements.

The Unit enables you to do a factory job before your customers' eyes . . . it attracts bearing jobs and related services that you get paid for and makes merchandise sales at a good profit. A number of Ahlberg Wholesalers tell me they have more than 100 Units like this out making money for service men in their territories.

*The Ahlberg Bearing Man*



Get complete details now on this Unit and Ahlberg's "Profit-while-you-pay" Plan. Ask your Jobber or write direct to 3028 W. 47th St., Chicago, Ill.

**WASHES**—Gun-type Washer flushes away every particle of dirt and old grease.

**DRIES**—Dryer-Gun attached to air hose leaves bearing ready for thorough inspection.

**RE-PACKS**—Easily operated packer completely fills bearing with new grease.

**STORES STOCK**—Cabinet holds complete replacement stock for leading cars.

Genuine Croft Equipment Sold and Guaranteed by More than 700 Ahlberg Wholesalers



**Ahlberg Bearing Company**

Manufacturers of CJB Master Ball Bearings

3028 WEST 47th STREET — CHICAGO — 30 WAREHOUSE BRANCHES  
Out West its PRECISION BEARINGS, INC. Los Angeles

4. To act as a solvent in the oil;
5. To improve the oiliness or load-carrying capacity of the oil;
6. To reduce the temperature at which the oil will pour;
7. To improve the viscosity index;
8. To change the color.

Now, taking the agents in order. The art in reducing or preventing corrosion of cadmium-silver or copper-lead bearings, which seem to be the focal point of all corrosion, is to design a lubricant in which the harmful acids that may develop in the crankcase will be held to a minimum. Nobody seems to be too sure just which are the attacking acids probably because the situation changes depending upon crankcase temperature. Reducing corrosion is a cut-and-try operation if there ever was one. There seem to be no blanket statements surviving from one test to the next.

To increase the stability of the oil means to increase its ability to withstand chemical change under conditions of operation. The chemical changes that fleet operators are most familiar with are the formation of sludge, lacquer or varnish. When such unpleasant substances are formed, the oil is not stable. If it was, the oil would remain as oil, despite exposure to moisture and other foreign matter, and not change to another substance.

There are two schools of thought on this matter of adding sludge and varnish inhibitors. One is that the metal surfaces of the engine act as a catalyst in the formation of sludge or varnish. A catalyst is a substance which accelerates a chemical action between two or other substances without itself undergoing any change. Men of this school believe that the metal in the engine helps in the formation of sludge. Their cure is to poison the metal so that it will not aid in any chemical action taking place in the crankcase. These men are partial to phosphorus compounds to do the job.

The other school favors inhibiting the oil itself with an anti-oxidant so that it will not combine chemically with oxygen and form undesirable products. This is usually done with sulphur compounds or chlorine compounds, and if you want to know more about them than that, you will have to find out from a chemist.

A detergent in the oil is a soap. When you wash your hands you use a water-soluble soap which removes the dirt from your hands and holds it in solution in the water, at least for a short time. A soap to be soluble in water must be a potassium or sodium soap. To be soluble in oil a soap must have barium, calcium, aluminum or other base. The detergent, when added, holds such products of instability as varnish or sludge in the oil in mechanical suspension instead

of permitting them to collect on the engine internals.

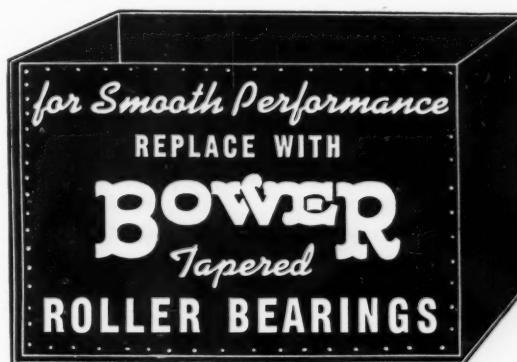
The other way of keeping the products of instability in oil differs only academically so far as the fleet operator is concerned. Instead of using a detergent a solvent is used and the foreign matter, instead of being held in suspension, is dissolved in the oil. The net result is the same. The sludge stays in the oil instead of accumulating on the engine.

Oil men say that it does not make much difference what happens to the oil so long as the engine is kept clean. This might be a point to re-

member when forming judgment of oil because it seems to be dirty and thick when drained. Perhaps the oil is carrying all the accumulated sludge out instead of plating the engine with a coating that will have to be removed the hard way, later.

One of the tricks in successfully adding a detergent or solvent is to get one that works and at the same time, does not actually increase the instability of the oil—that is, while it is holding sludge in suspension or solution, increase the formation of sludge and stuff. Some of the deter-

(Continued on page 82)



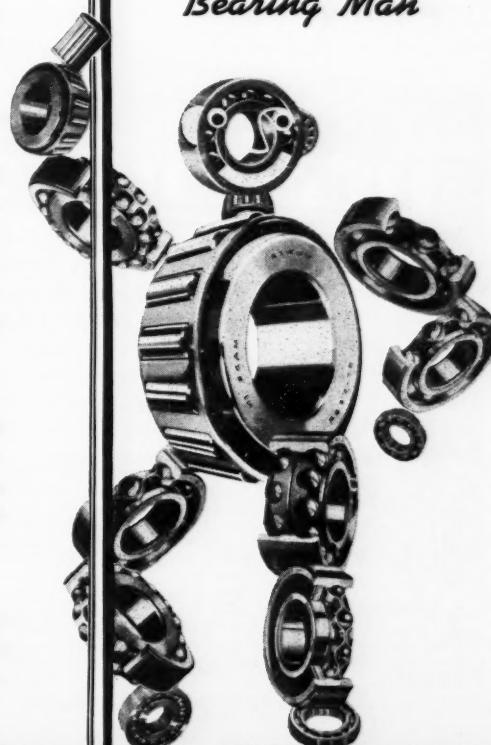
**Y**OUR best guarantee of perfect performance in a roller-bearing replacement job is a Bower unit — the "Micro-Honed" bearing that needs no "run-in" nor final adjustment.

For instance, many shops are replacing worn Differential Bearings with Bower Tapered Roller Bearings. Bower Bearings put an end to differential bearing troubles, give better load-carrying capacity, greater rigidity and finer adjustment.

Exclusively original equipment on leading automotive lines for years, Bower Tapered Roller Bearings are now available from more than 700 Ahlberg Wholesalers.

Let Bower Bearings build  
good will for your work with  
their long life and super-  
smooth performance.

Says the  
Ahlberg  
Bearing Man



**Ahlberg Bearing Company**

Manufacturers of CJB Master Ball Bearings  
3028 WEST 47th STREET — CHICAGO — 30 WAREHOUSE BRANCHES  
Out West to PRECISION BEARINGS, INC., Los Angeles

## Why Are Chemicals Added

(Continued from page 81)

gents do that and it is sometimes necessary to add another inhibitor to stabilize the oil to offset the effect of the detergent.

Some refiners treat an oil to increase the oiliness or load-carrying capacity of the oil. Despite the fact that no engine has bearing loads great enough to tax the ability of straight mineral oil to carry the load, tests with some oils have shown that an appreciable wear reduction can be obtained by the addition of this type of agent.

This sounds contradictory and to a degree it is contradictory. The film strength of an oil is a measure of its ability to carry a load without breaking through the film. With some oils that maintain film under given loads, better wear results are obtained by adding film strength or oiliness agents. No one seems to know just why and if you can clear it up for them you will be entitled to the accolade which will be yours. You will probably have to start by defining and segregating the characteristics of the elusive term "oiliness."

The point at which oil will pour or remain liquid is important in cold

weather. Additives have been developed that keep the crystals, which form as a result of low temperature, from attaching themselves to each other, thus preventing the oil from becoming a crystalline mass. The amount of additive will vary from winter to summer without any knowledge on the part of the operator. There is no reason to treat an oil to pour at 10 deg. Fahr. or zero deg. when the lowest temperature it will encounter will be 70 deg.

The viscosity index improver is added simply to make the viscosity, which is a measure of the oil's resistance to flow, nearer the same value at varying temperatures. Mineral oil will flow faster or thin out as the temperature of the oil is increased. This means a greater spread in the viscosity of the oil between starting temperature and at operating temperature. By adding the viscosity index improver the difference between the viscosity at starting temperature and the viscosity at operating temperature is reduced.

In adding a viscosity index improver the oil is made more viscous or heavier at all temperatures. If an agent is to be added to oil to improve the viscosity index the refiner has to start with a lighter oil and the addition of the chemical makes it a heavier oil as well as improving the viscosity index. As an example of what a viscosity index improver can do, in one case an SAE 10 oil was rated at 50 Saybolt seconds at 210 deg. and after the addition of 10 per cent of the additive it was 103 seconds at the same temperature.

The additive to change the color does not change the color at all when viewed through transmitted light. All mineral oil, when held up to the light, is red. In reflected light the bloom, as it is called, may be red, green, blue or amber. Green seems to be a favorite color and in some cases the oil is dyed to make it green in reflected light. So far as the quality of the oil is concerned the addition of a coloring agent does not affect it.

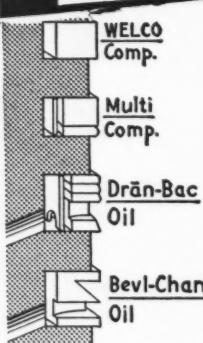
A number of mechanics have been apprehensive of what will happen when two oils containing different additives are mixed in the field without the benefit of laboratory supervision. The oil technicians seem to think that nothing startling will happen. They say that none of the additives are violently active and that their effect upon one another when mixed will not bring any disastrous results. They are of the opinion, however, that when you mix two treated oils you wind up with a mixture that is not as good as either oil separately.

If treated oil would only follow rules it would be a great deal easier to make general statements about it. However, this much can be said: by (Continued on page 120)

# No "Breaking In" Period with



## "Drän-Bac 'H' Sets"



... the free-running Sets that end drag, oil pumping and peg a new high for pep and power from the moment installed.

If the starter works, so will the motor after an "H" Set installation! "H" Sets give you LIVELY motors because all rings are precision-engineered to give free-running, long-lived performance. The multiple wiping edges of the Drän-Bac oil ring and ring have a continuous in-out, up-down flexing action which does FIVE things; (1) stops oil pumping, (2) seals compression, (3) permits proper cylinder lubrication, (4) prevents carbon clog and (5) actually slows-down cylinder wall wear.

Ring specialists, service managers and shop owners everywhere are building car-owner confidence and their own reputation on "H" Sets. So can You. Stop comebacks by using "H" Sets on every job. Ask your jobber.

Jobbers: Send for sample "H" Set and our proposition today, NOW!



# You Don't Need to Experiment When you use **CoMaX** Brake Lining

**WAGNER** maintains **26** Proving Grounds, and  
YOU get the benefit of this valuable experience

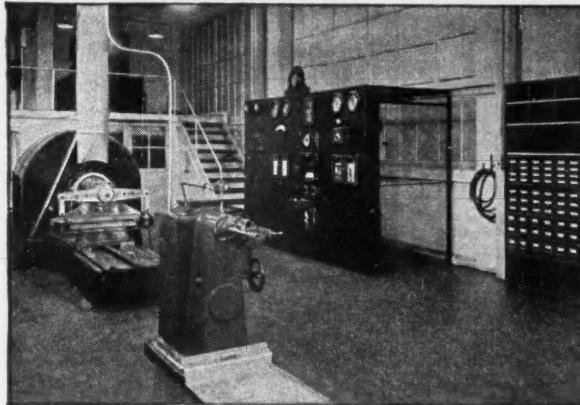


Illustration above shows one view of the Wagner Brake Service Testing Laboratory in St. Louis. Completely described in Bulletin HU-10.

Wagner knows brakes!—As manufacturer of Lockheed Hydraulic Brakes, Wagner has a valuable background of experience in braking problems. Wagner is well equipped to know the type of lining a brake should have—and this knowledge is reflected in CoMaX specifications.

Wagner interest does not stop with the manufacture of brakes or with the sale of CoMaX. Realizing the value of a "never-ending" firsthand study of all braking problems, the Wagner Brake Testing Laboratory was built in St. Louis. Tests made in this great scientific laboratory are supplemented by handling actual service jobs in the model service departments of 25 strategically located Wagner branches, a total of **26** Wagner Proving Grounds.

## USE CoMaX ON YOUR NEXT JOB

CoMaX brake lining is ideal for quick, safe, smooth stops—It is long-lived . . . has reinforced backing . . . is non-compressible . . . uniform in texture . . . easy on drums . . . ideal for high speeds . . . quiet . . . smooth . . . age proof.

Available in sets, rolls, blocks and slabs.

### MAIL COUPON for FREE COPY of NEW CATALOG

Don't delay! Ask for a copy of the big new Wagner CoMaX Brake Lining Catalog BU43B. It is unusually complete, gives specifications, prices, etc., for trucks, buses and passenger cars. It's FREE, so ask for a copy NOW!



AUTOMOTIVE PARTS DIVISION B40-4A  
MA  
**Wagner Electric Corporation**

6400 Plymouth Avenue, Saint Louis, Mo., U.S.A.

Gentlemen:

Send complete information on Wagner CoMaX. Also send Catalog No. BU-43B and service cap FREE.

Name \_\_\_\_\_

Firm and Position \_\_\_\_\_

Address \_\_\_\_\_

City and State \_\_\_\_\_

We buy lining from \_\_\_\_\_

"MOBILIZING AMERICA'S ECONOMIC STRENGTH" was the topic discussed by authorities in the fields of economic, industry and research, at a luncheon given by Alfred P. Sloan, Jr., Chairman of General Motors, in New York City last month. Left to right: Paul Hoffman, president, The Studebaker Corp.; C. F. Kettering, General Motors vice-president; Alfred P. Sloan, Jr.; William S. Knudsen, National Defense Advisory Commission; George V. Denny, Jr., of "Town Hall of the Air" radio program; Sumner H. Slichter, professor of business economics, Harvard University, and Harold G. Moulton, president of the Brookings Institution, Washington, D. C.



**More Than Ever AMERICA NEEDS BEAR WHEEL ALIGNMENT SERVICE**

★ ★ ★ ★ ★ ★ ★

Here's How YOU Can Cash In Without a Big Investment!

Get Ready Now to meet the Nation's need for safer, more efficient transportation.

Join the Bear Shops who are telling America about their Bear Service with National Advertising,\* . . . who are selling thousands of motorists and fleet operators the extra precision of Bear Wheel Alining.

Make your arrangements now with your Bear Jobber to get Bear Precision Alinement Equipment in your shop! Get the extra value of Bear's

exclusive features that enable you to furnish faster, more accurate service. Get the PLUS VALUE of Bear's National Advertising to back you up!

Remember . . . all you need is a small space for installation . . . the Bear Equipment will pay for itself out of the profits. WRITE NOW for details and information on Bear Jobber's Easy Payment Plans. Address: BEAR MFG. CO., Rock Island, Illinois.

\*The next advertisement will appear in the November 18th issues of TIME, the weekly news magazine.

Tell America Your Shop is Ready To Serve—  
Get Your BEAR SIGN Out In Front!



Copyright, 1940, Bear Mfg. Co.

You don't need a million to get in on Big Profit Wheel Alinement. LOOK INTO THE NEW LOW PRICED BEAR No. "110-80" WHEEL ALINER. Send for BIG FREE CATALOG TODAY . . . see how this inexpensive machine enables you to make every alinement test and correction to highest Bear Precision standards.



### Chase Honored As Pioneer

Julian Chase, automotive industry pioneer, was cited for an award because of his significant contributions to the development of the motor car, at a luncheon of the Automobile Old Timers in New York, last month.

He engaged in development work—designing, building and selling automobiles—immediately on his graduation from Brown University in 1899. He entered the trade publishing field in 1906 as editor of an automotive and marine publication, and in 1915 he became editor and part owner of *The Horseless Age*, one of the forebears of the present *Automotive Industries*. The year 1918 found him on the General Staff of the War Department, organizing training centers for transport drivers. Since 1933 he has been directing editor of *Automotive Industries*, *MOTOR AGE*, *Commercial Car Journal* and other automotive publications of the Chilton Company, Philadelphia.

Other pioneers cited for awards were: Ransom E. Olds, after whom two motor vehicles were named—Oldsmobile and Reo; Charles B. King, builder and driver of Detroit's first automobile; Walter C. Baker, father of the electric car, and Charles S. Henshaw, veteran in the dealer field.

### Bendix Acquires Plant

Title has been acquired by Bendix Aviation Corp. to the plant at Wayne, Mich., formerly occupied by Graham-Paige in the manufacture of automobile bodies.

D. O. Thomas, vice-president, who negotiated the deal for the corporation, has said that this plant will become one of the units in the group of Bendix plants in their part of the work in the National Defense Program. Bendix takes part in National Defense because of its position in the aviation industry, as well as in automotive, marine, and ordnance divisions.

The plant is modern in type and construction, with an area of 265,000 sq. ft. of floor space, on approximately forty acres of ground, affording ample room for additional building if desired.

"KNOW-HOW" BUILDING



● When you install a set of Rich Valves, you are confident about your customer's satisfaction. Behind your confidence stands this building, with its foundation of sound engineering. It is the laboratory of the Wilcox-Rich Detroit plant.

Torture chambers are here to batter and warp valves not up to the Rich standard in the interest of constant improvement of Rich Valve performance. Engines of Tomorrow are here to be fitted with the exact valve-gearing to yield peak efficiency. The technical staff here is the largest group of Specialized Valve Engineers in the world.

The makers of Rich Valves know how to gain your confidence—and to keep it.

# RICH VALVES

OF SILCROME-X STEELS

RICH VALVES are made of SILCROME-X STEELS. They are sold for replacement only by McQUAY-NORRIS and KING QUALITY JOBBERS . . . WILCOX-RICH Division of EATON MANUFACTURING CO., Detroit, Mich.

# SAFETY INSPECTIONS

(Continued from page 41)

averages fifty-four feet from the point where he first senses the danger to the point of brake application. With brakes in good condition, the car will be stopped in within two hundred feet from the point of brake application. But with brakes only forty per cent efficient it will require another one hundred and six feet or so to stop the car. Statistics have it that one-fourth of our cars add over a hundred feet to the stopping distance.

Since the falling-off in brake efficiency is gradual, many motorists do not sense the accumulating wear and loss of brake power. The brakes actually get out of time because of this fact.

Slippery road surfaces, poor wheel alignment and excessive play in the steering mechanism and spring shackles greatly add to the danger of driving with inefficient brakes.

There are no figures available as to accidents caused by poor vision,

especially at night. The driver of a car must be able to see where he is going at high speeds but also motor vehicles ahead must be visible to him. The "one-eyed" car continues to be a menace to night driving and while some states have done something about it the fact remains that motorists in general are still at the mercy of those who fail to comply with car lighting laws.

Good lighting starts with the battery and cables. If the battery has seen its best days—a new one is the answer. The same is true of cables. Corroded cables offer high resistance to the current and the loss in voltage may mean the difference of having good lights or poor and unsafe lights. Many cars are being driven at sixty miles an hour and over at night with thirty mile an hour headlights. Polishing reflectors or installing new ones in the older types of lights may help some, but often better lighting is available from a new battery, cable, generator or installing a relay, especially if there is a lot of wiring to the headlights. Sometimes new wiring is installed which is too small to carry the load and the resultant drop in voltage robs the lights of candlepower. Headlight testers that measure the output of the lamps quickly reveal these conditions and help to give motorists better lights.

Better lighting can be had in many cases by merely replacing a broken lens or reflector. Or, by installing a new tail lamp. Safety lane inspections show a vast number of cars in which the lamps are not aimed properly and naturally in such cases the driver is not getting the best from the lights.

Broken window glass and windshield glass patched with tape obstruct vision. And it is surprising the cars that are caught in safety inspections with worn-out windshield wiper blades. Certainly they are not costly things to replace and do contribute much to safety in driving.

When an emergency arises, the driver of a motor vehicle often has to make a quick turn to avoid collision. This means there must be no binding in the steering mechanism but in addition there must be no excessive play in the steering mechanism. Tires in bad shape, worn out threads in tie-rods and drag-links, loose U-bolts holding the springs to the axles, worn spring shackles and wheel bearings, wheels out of balance, and so on, often are overlooked and really are to blame many times when the newspapers say "it is believed the driver lost control." Drivers of such cars do not lose control, there is little or no control to start with.

Safety must also consider the car's exhaust system, especially the muffler. The muffler can be the source of

(Continued on page 120)

**PICK the complete line of quality oil filters that will make friends and profits for YOU!**

**Pick**  
Replaceable  
Cartridge Type  
**OIL FILTERS**



STANDARD  
Model P1



SUPREME  
Model P2

**Low  
in Cost  
•  
Efficient  
in Operation**

## STANDARD Model and SUPREME Model

- remove carbon and sludge.
- filter and purify the oil.
- have high quality, popularly priced replaceable cartridge.
- have MAGNETIC SEPARATOR which removes iron and steel particles from oil.

The Pick Standard Model is recommended for installation on engines having crankcase capacity of 7 quarts or less. Supreme Model for those with 8 quarts or more . . . Ask your jobber or write us for details on full line of PICK Oil Filters as well as replacement cartridges for all makes of filters. Also get details on complete line of Replacement Water Pumps . . . Don't delay!

**PICK MANUFACTURING COMPANY**  
WEST BEND, WISCONSIN

# \* '41 DE SOTO TAKING U. S. BY STORM \*



OFF TO A FAST START WITH THE FINEST RECEPTION IN DE SOTO'S HISTORY. DE SOTO DEALERS ARE SET FOR THEIR BIGGEST YEAR!

ONE SHORT MONTH AGO, DeSoto for 1941 was introduced to the public. Today, this long, sleek car is sweeping the country—playing to packed houses in cities, towns and villages all over the U.S.A.!

One short month ago, DeSoto alone knew that the biggest news of the year would be Fluid Drive, new Simplimatic Transmission, Rocket Bodies, Two-Tone

Interiors—the backbone of *De Soto's own product story for '41!* Today that news is spreading like wildfire from the lips of the thousands who have seen and driven this newest of new cars!

#### Big Opportunities

Enthusiasm is high everywhere! DeSoto dealers have already gotten a real taste of the tremendous pulling power of this great DeSoto—and the *big selling months are still ahead of them!*

Never before has the DeSoto Franchise presented such wonderful opportunities. The new 1941 DeSoto is destined to be the greatest seller and profit maker in DeSoto's history. The Franchise includes also a great advertising and merchandising program. But even that's not all!

**De Soto Called  
Year's Newest  
New Car!**

AUTO BUYERS SHOW  
GREAT INTEREST IN  
**DE SOTO FLUID DRIVE**

Automatic Shifting for  
All Normal Driving  
Added Selling Feature

#### Brilliant New 1941 Plymouth Too!

DeSoto dealers have a great new Plymouth outh to sell—the "One" for '41 in the low-price field. Write L. G. Peed, DeSoto Division of Chrysler Corporation, Detroit, Michigan, for full particulars.

**SMART GOWN-SMART CAR.** Raymond Loewy, designer of the Studebaker car, designed the Studebaker Gown (on the shapely chassis of Model Lillian O'Donnell, second from left). Left to right, Commander E. F. MacDonald, president, Zenith Radio Corp.; Miss O'Donnell, Miss Carol Bruce, star of "Louisiana Purchase"; George D. Keller, vice-president of Studebaker, and C. S. Fletcher, Studebaker sales manager.

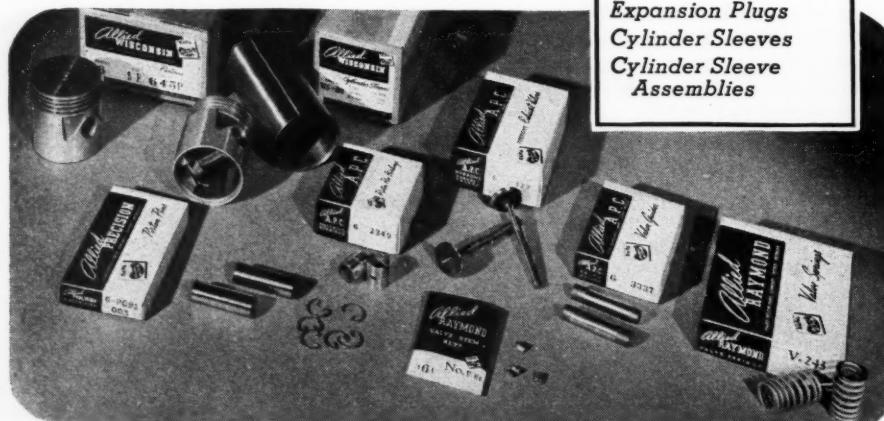


# Allied MOTOR PARTS

**Y**OU HAVE double assurance of quality when you use Allied Motor Parts in your motor service jobs.

You have the assurance of the manufacturer whose entire resources are concentrated on making each product the finest that can be had. In addition, you have the added confirmation of NAPA's "Assurance of Quality," borne by every part.

Finally, you're sure to get the kind of service you want—all of these parts, for all cars, from one friendly and co-operative source of supply, backed up by a nearby NAPA Warehouse carrying complete factory stocks. . . . See your nearest NAPA jobber.



**ALLIED MOTOR PARTS COMPANY • DETROIT**

## Overhauling on Credit

(Continued from page 43)

who came into the shop a complete repair job, down to the smallest scratch on the paint. "Bumper to bumper" service, he calls it. The car had to leave the shop in first class shape all around. His are not the ordinary \$5 to \$15 jobs. If a customer says that he is unable, financially to undertake to pay for the job that his automobile needs, his objections are removed by arrangements to pay his bill at rates as low as \$1 per week. He is also shown that the price he pays for parts and labor are the same as he would pay cash for at any reputable dealer's shop. The credit plan does not jack up the price of the job one penny. In addition, each job is turned out with a 90-day guaranty.

Comegys carries a good stock of parts. Tires, tubes and accessories are also part of his stock. Parts and accessories are suggested only if the automobile needs them, and are displayed for the auto owner to see that they are carried in stock. Comegys buys on an average of from \$1,500 to \$2,000 in new parts per month. From a payroll of \$71 for the first week in operation, this business now has a payroll of \$450 per week. The shop force includes nine mechanics, three body and fender men (metalmen), two painters, two porters, shop foreman and bookkeeper.

In the space of 20 months, this business has gone a long way. A few months ago the enterprise was incorporated for \$20,000, and Comegys holds the position of secretary-treasurer. Last year's volume of business was \$40,000, on which Gus claims he made a profit of \$15,000. Monthly volume now averages about \$7,000. Attesting to his success is the fact that at this time plans have been completed by the corporation to open three more branches in Philadelphia; in the three other largest sections and one in Upper Darby, Philadelphia suburb. Two-thirds of the business is done in engine overhauling, tune-up and electrical repairs; the other third includes metal work, tires, tubes, accessories and painting.



## Safe behind Glass

IN the modern double-glazed house, the window and the storm sash form a glass sandwich with a layer of dead air in between that keeps baby safer from cold all winter long . . . And when baby goes out in the family car, his ride is made safer from harm by another glass sandwich—by those two plates of glass with a tough layer of plastic in between which is Hi-Test Safety Glass. And Safety *Plate*

Glass—not only in all windshields, but also in the side windows of many of the new cars for 1941—is further proof of the motor industry's special regard for *clearer* and *safer* vision for driver and passenger alike. When you buy a new car, or when you have to replace a broken window or windshield, look for the L·O·F shield in the corner of the glass. It's the mark of quality—of a safer car and a safer drive.



**LIBBEY·OWENS·FORD**  
HI-TEST SAFETY PLATE GLASS

SAFER BECAUSE IT'S LAMINATED  
CLEARER BECAUSE IT'S PLATE

# WOMEN LIKE SUPER SERVICE

(Continued from page 31)

thing when I bought it," or, "It looked so pretty in the store"?

We're not trying to convince you of the value of having these women as customers. We assume that you *must* want this business. Not only does it represent a large volume, but much of the sales and merchandising effort planned to appeal to women is equally productive with men.

For example, for many years the

merchandising experts have been singing the advantages of the super service station as a "natural" for the automotive industry. Well, it's even more of a "natural" for attracting women.

The department store which covers a square block and extends eight or nine stories in the air, is nothing but a de luxe super service station. Here a woman may purchase all the cloth-

ing she needs for her entire family. Here she may furnish her home, plan her garden, stock her pantry, fill her medicine chest. Here she may have her hair waved, her picture taken, her figure faults corrected. She may eat her luncheon, have her eyes examined, her shoes repaired—all under one roof and on one charge account.

At the new super food markets she may purchase under one roof and in a few minutes have all the items that it took her grandmother days to make, and her mother many hours of going from store to store to buy. The butcher, the baker, the fresh fruit and vegetable merchant, and the corner grocer—all their wares may today be found in the super market.

Of course the added advantage of being able to do all one's shopping under a single roof does influence the buyer, but of equal importance to both the buyer and the retailer is the psychological effect of seeing so much merchandise on display. In the days of the independent small shops the lady starting out to purchase a hat went directly to the milliner's. On her way she may have passed a book store, or a shoe shop, but the limited window space displayed only a few articles, and so she was seldom tempted to buy their wares.

Today the lady who goes to buy a hat is told that millinery is on the third floor. On her way she sees whole counters of handbags, gloves, hosiery, jewelry, lingerie, cosmetics, and a dozen other items. Indeed, the woman who can leave a department store (or a super market) with only the articles she had originally intended to purchase is a rare and strong-minded person.

With a super service station you create the same effect upon your customers. Its shining, clean, attractive appearance is just what women have been clamoring for when they complained of what they considered unnecessary dirt in garages.

Whether or not your new super service set-up allows you to handle new and more varied kinds of work is of relatively little importance. The chances are that your old shop was equipped to handle pretty much the same jobs. The difference lies in your customer's attitude. Coming in to buy gasoline, the lady sees efficient-looking gadgets for lubrication, washing, and repairing, which remind her of her own car's needs. Eye-catching displays remind her of accessories she's always wanted for her own car, or suggest gifts for auto-loving friends. The cleanliness of the whole place assures her that her car won't be returned with a grimy steering wheel to ruin her gloves or smear her hands.

The shop appears efficient, too—gives the impression that the men know what they're doing—and that's mighty important to a woman whose ignor-

(Continued on page 120)

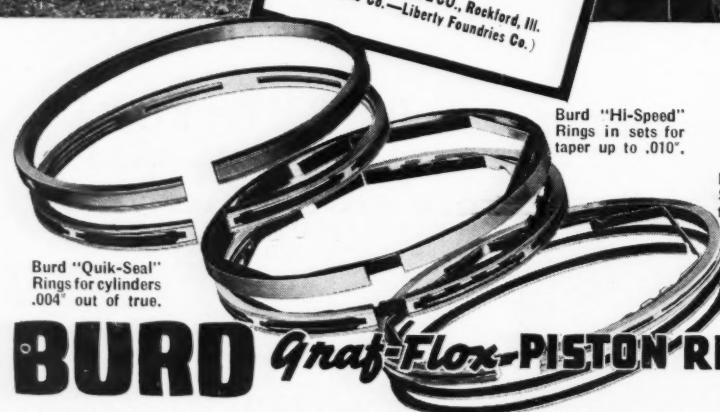
## New performance Records

### Wherever Piston Rings are Used



In a single year, "Graf-Flox" — the amazing new process that makes piston rings do things never before accomplished — has become the talk wherever piston rings are used. The self-seating surface of "Graf-Flox" — the self lubrication that reduces friction to a fraction also stands guard against scuffing or sticking — gives new resistance to wear. Write for details on "Graf-Flox", a claimed the most revolutionary development in piston ring history.

BURD PISTON RING CO., Rockford, Ill.  
(Associate Co.—Liberty Foundries Co.)



Burd "Quik-Seal" Rings for cylinders .004" out of true.

**BURD Graf-Flox-PISTON RINGS**

When writing to advertisers please mention Motor Age



# IT'S HERE!

**I**t's here . . . years ahead of its time!

It's here . . . with improvements so notable that every road and laboratory test shows sensational results. It's Quaker State's greatest contribution to date . . . the New Stabilized Quaker State Motor Oil . . . an oil so chemically stable that it successfully resists oxidation under the extreme action of heat, pressure, and contaminants present in the modern internal combustion motor. Use the coupon now . . . today! It brings you important news!

TECHNICAL RESEARCH LABORATORY, DEPT. IIC  
**Quaker State Oil Refining Corp.**  
**Oil City, Pa.**

Gentlemen: Please send me at once your free technical booklet containing comparative tests, data, and descriptive matter on the New Stabilized Quaker State Motor Oil.

Name.....

Street.....

City..... State.....

(Cut this out—Fill in—Paste on Penny Post Card)

## STABILIZED QUAKER STATE MOTOR OIL

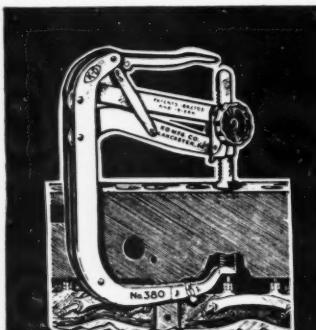
**WINS WORLD'S FAIR AUTO RACE.**  
Harvey D. Gibson, Chairman of the Board of the New York World's Fair, presents a trophy donated by the Ford Motor Co. to Frank Griswold, of Radnor, Pa., winner in the "unlimited" class at the Grand Prix motor races on the Fair grounds. At the right is Ralph De Palma, veteran racing driver.



## *You need these K-D tools*

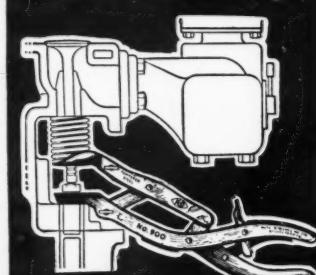
### • FOR COMPRESSING VALVE SPRINGS

On valve-in-head and most L-head motors. Hand wheel depth adjustment. Makes an easy, one man job of compressing springs, frees both hands to work on keepers. One pair straight and one pair offset jaws, both adjustable to different springs. Rugged bar steel construction. Can't be beat for general shop work. **K-D No. 380**



### • FOR UNDER-FENDER VALVE LIFTING

On some of the late models where you have to work from below, here's the Lifter! Short enough to get into all these motors, offset enough to let you see what you're doing. Auxiliary jaws when extra-high lift is needed. Jaws parallel in action and adjustable to different springs. **K-D No. 900**



### • FOR SIZING PISTON RINGS

When you want to take rings down to an odd size and still be sure the ends are parallel and square, here's your tool! Adjustable gage handles square, diagonal, step and sectional rings. Machine shop accuracy. **K-D No. 870**



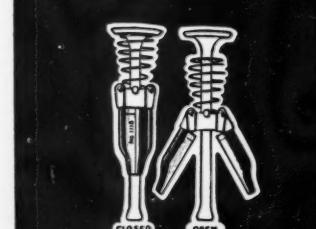
### • FOR LIFTING VALVE SPRINGS

On most L-heads, here's an old favorite of proven dependability. Tempered steel jaws parallel in action and adjustable to different springs. Many thousands of these Lifters giving satisfactory service every day. **K-D No. 600**



### • FOR GRINDING VALVES IN FORDS

You'll need bushings to use in place of guides when grinding valves and when establishing stem-to-tappet clearance. These one-piece Bushings are accurately machined to fit, hinged to take valve as shown. Sizes for all Ford motors. **K-D Nos. 511, 1118, 1160**



DID YOU GET YOUR COPY OF THE NEW  
K-D CATALOG? IF NOT, WRITE TODAY.

Canadian Factory . . . Hamilton, Ontario

**K-D MFG. CO.**

Ask Your Jobber for Dealers'  
Net Prices

**LANCASTER, PA.**

### Attendance at National Auto Show Up 11%

Competing with news of war, politics, the draft and the final week of the New York World's Fair but under favorable weather conditions, the National Automobile Show, with two almost record closing days, enjoyed a paid attendance 11 per cent greater than 1939, indicating wide interest in 1941 cars and trucks.

Trade attendance was unusually heavy as many dealer's shows cancelled with armories in full use for defense.

Outstanding in interest was the historic car exhibit that furnished evidence of remarkable progress in design, construction and value for your dollar.

More than 12,000 votes were cast by visitors to decide the most interesting of the 40 cars entered, based on age, condition and past performance. A 1900 Rockwell Hansom Cab (1555 votes) owned by James M. Melton, radio singer, won the blue ribbon and \$100 in cash.

### **H. H. Timken, Sr.**

H. H. Timken, Sr., chairman of the board of The Timken Roller Bearing Company, died Oct. 14, in his home at Canton, Ohio. The immediate cause of his death was pneumonia, which developed from chronic asthma. His illness was of short duration.

Although still active in the business which he founded with his father and brother, in 1898, his two sons, H. H. Timken, Jr., and W. Robert Timken, in recent years have taken an active part in the company's management.

### **Earl Blackburn**

Earl Blackburn, MOTOR AGE circulation representative in Illinois and other Mid-western areas, died, Sept. 25. Blackburn joined the Chilton Co. in 1936 and since that time had won a host of friends in the automotive retailing field. His death was the result of an automobile accident, when the car in which he was driving struck a soft shoulder on a road in southern Illinois, and rolled over four times. He was forty years of age and is survived by his widow and a son.

# MOTORISTS DON'T HAVE "9 Lives"



*"A Safe City  
makes for Happy People"*  
BE SURE  
Your BRAKES are SAFE!



POLICE DEPARTMENT CITY OF NEW YORK, SAFETY PROGRAM  
Contributed by Raybestos BRAKE LINING F. N. LA GUARDIA Mayor

Unlike cats, motorists have no lives to spare! For 36 years Raybestos has been a major contributor to improving Brake Safety as car speeds have increased. Today, Raybestos is America's Biggest Selling Brake Lining.

For 1941 Raybestos is extending its Safety Poster Campaign in co-operation with Police Departments in every State. Sixty-four million magazine advertisements are urging Brake Inspection every 2,500 miles.... Making Safety pay for both the car owner and the Raybestos dealer.

THE RAYBESTOS DIVISION  
of Raybestos-Manhattan, Inc.  
BRIDGEPORT, CONN.

BRAKE LINING, CLUTCH FACINGS, FAN BELTS, HOSE,  
FOR CARS, TRUCKS, BUSES, TRACTORS.



# Raybestos

AMERICA'S BIGGEST SELLING  
BRAKE LINING

**"YOUR 2 BEST FRIENDS for HIGHWAY SAFETY"**

## Race Car Design Influences "Future Cars"

(Continued from page 54)

ing car, is that it has a steel top which completely disappears in the deck at the touch of a button. This is a radical departure in design, since the owner has the choice of riding in an open or closed car and at the same time be provided with all the safety of steel construction. Automatic push buttons also control the raising and lowering of the window glasses.

Front headlamps on the "Thunder-

bolt" have retractable lids and a perfectly fixed mounting for the sealed beam units. Every accessory is in-built, license plates being mounted under glass and door handles of the disappearing type. The instrument board is leather-covered, while against this leather background are set round etched dials of lucite, which are illuminated by indirect lighting. Roberts derived the idea from an instrument design he had seen at a Paris Salon before the war.

The "Newport" is built on the Chrysler Crown Imperial chassis of 145 1/2-in. wheelbase and 143-hp. The "Thunderbolt" is built on a chassis of

127 1/2 ins., with a 143-hp. Crown Imperial engine.

Buick's "Car of Tomorrow" is mounted on a special chassis, with 123-in. wheelbase. Small wheels and 13-in. tires, three inches less in diameter than normal, help accentuate the "close to the road" appearance. Special airplane brakes of the Sirocco air-cooled type, retractable headlamps, doors operated by small electric motors and controlled by a switch on the instrument panel, and a convertible top that is completely concealed in the deck when not in use are other unique features of Earl's streamlined creation.

## Carburetor Service Merchandiser Announced

A new merchandising unit that occupies less than 2 sq. ft. of counter space is announced by the Carter Carburetor Co., St. Louis, Mo. This attractive display contains a carefully selected stock of Carter carburetor parts, nine of the new time saving Repair Packages, nine sets of

**Cole-Hersee Company**  
**BOOTH B-320 B-322**  
A. S. I. S. — DEC. 9-14 CHICAGO

*Mr. Jobber*

LOOK OVER THE NEW MODEL CARS  
AT THE  
**NATIONAL AUTOMOBILE SHOW**  
AND YOU WILL SEE THAT LEADING  
CAR MANUFACTURERS EMPLOY SOME

*Cole-Hersee*

**COLE-HERSEE PRODUCTS**  
AS ORIGINAL  
CAR EQUIPMENT

**COLE-HERSEE PRODUCTS**

- I** Ignition Lock Switches  
Ignition Terminals
- K** Knobs, Switch
- L** Line Connectors
- M** Magnetic Solenoid  
Starter Switches  
Momentary Switches  
Mounting Nuts
- P** Pillar Switches  
Pilot Lights  
Plugs  
Push-Pull Switches
- S** Sockets  
With Wire Leads  
Sound and Projector  
Equipment, 110 Volt  
Socket and Plug,  
Battery Charger  
Socket and Plug, Defroster  
Starter Switches  
Stop Light Switches
- T** Terminals, Wire  
Toggle Switches  
Trailer Connectors
- W** Windshield Wiper Switches  
Wire Terminals

**COLE-HERSEE COMPANY**  
54 Old Colony Avenue Boston, Mass.

Rep.—Eastern Canada-Ontario-Quebec-Mariottes  
S. F. BACHER & CO., 310 Spadina Ave., Toronto, Ont.

SEND FOR  
NEW 1941  
CATALOG  
to Dept. All



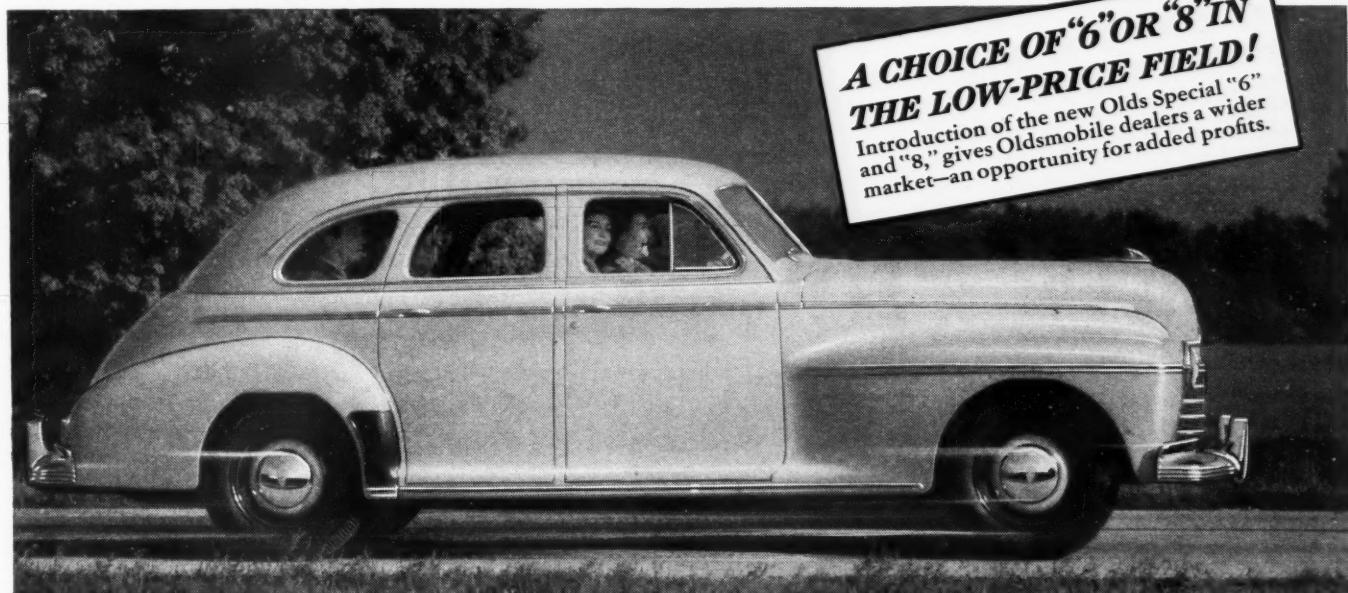



carburetor gaskets and two Carter fuel filters. In addition there are some essential service tools, motor tune-up manuals and instructions for servicing Carter carburetors (with one year's bulletin service at no additional charge), fuel filter counter display stands, as well as posters and folders.



"And tonight's the night of the  
Mechanics' Ball."

# No matter what they want- OLDS DEALERS HAVE IT TO SELL!



**A CHOICE OF "6" OR "8" IN  
THE LOW-PRICE FIELD!**

Introduction of the new Olds Special "6" and "8," gives Oldsmobile dealers a wider market—an opportunity for added profits.



## **A NEW DYNAMIC CRUISER**

A completely new body design. Dynamic! Sporty! Latest in mod-

**TO SELL AT  
POPULAR PRICE**

ern streamlining! Already a tremendous hit with people, everywhere!



## **A LUXURIOUS MEDIUM-PRICED**

## **CUSTOM CRUISER**

1941 version of the "best looking car on the road"—with longer

wheelbase, wider tread and roomier body! It's Oldsmobile again!

**THE CAR  
ahead!**  
IT'S

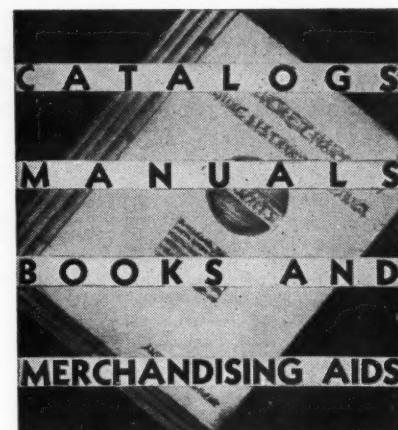
# **OLDSMOBILE**

## New Company Formed

Ralph M. Abel, founder and formerly president of the Ki-Sol Corporation, has announced the formation of Ralph M. Abel & Company of St. Louis, Mo. The new company will be headed by Ralph M. Abel, who will also act as sales manager. The company will manufacture and distribute through wholesale outlets two of its products, one, named Red Arrow Cleaner No. 1, which is a hot tank cleaner used for cleaning and degreasing airplane engines, automotive engine blocks and crankcases. The other, Red Arrow Cleaner No. 2, is

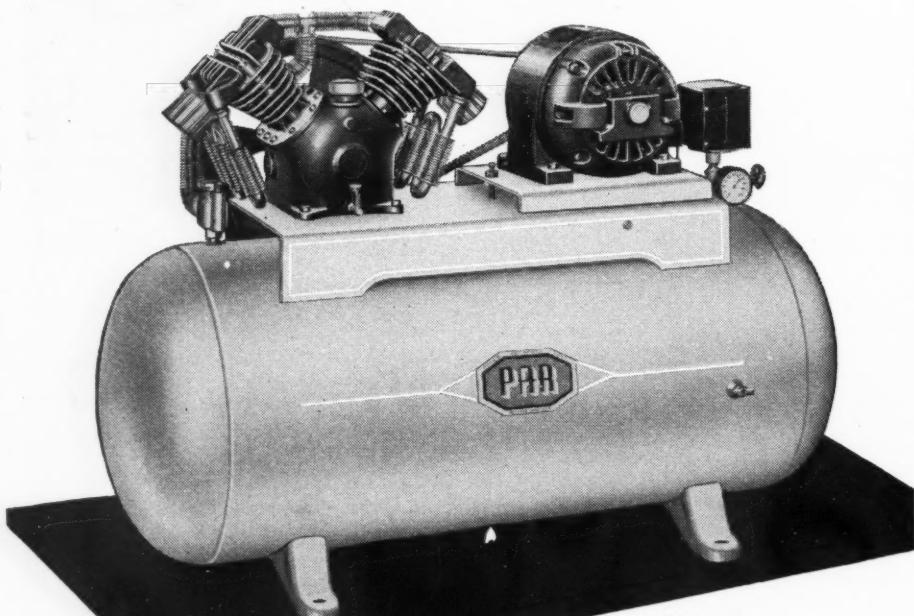
a new type cleaner for all die cast parts as well as brass and iron. Red Arrow No. 2 is non-inflammable, non-explosive, and no brushing of parts is required. Under careful laboratory and field tests made the No. 2 was found to clean merely by soaking for a few minutes the dirtiest, most gummed and carboned parts obtainable.

Red Arrow No. 2 utilizes the newer developments of the chemical research field in that it is a non-evaporative cleaner, it does not lose its cleaning effectiveness with repeated use and the only loss is through "drag-out." Literature is available for the asking.



To receive a copy of the free literature mentioned in some of the following items, just check the square on the postcard on page 97 which corresponds to the letter given the literature you desire.

## "WE'D BUY PAR AGAIN"



Writes the  
IDEAL FINISHING CO.  
PEABODY, MASS.

WE HAVE been using a Par Model 501 air compressor in our spray room for over a year supplying 4 Sprayco guns. This compressor runs on an average of 18 to 20 hours a day.

We are so pleased with it that if we were to purchase one tomorrow it would be a Par.

SIGNED *Rueben Carpenter*

See your jobber or write direct.

MODERN EQUIPMENT CORPORATION • DEFIANCE, OHIO

A new 36-page booklet by Oakite Products, Inc., 24C Thames St., New York City, is brimfull of helps for the garage man. It explains in detail how to clean and recondition automobile cooling systems, how to clean parts for inspection, how to de-sludge motors, how to clean cement floors and painted walls, and a number of other problems in the line of cleaning and paint stripping. Send for your copy. Check "A" on the post card, page 97.

\* \* \*

"Aluminum Pistons and Aluminum Cylinder Heads" is the title of a booklet published by the Aluminum Company of America, Pittsburgh, Pa. It discusses the various designs of pistons and types of piston finishes, and devotes one chapter to the use of aluminum cylinder heads. To get your copy, check "B" on the post card, page 97.

\* \* \*

The Magnus Chemical Co., Inc., Garwood, N. J., has issued a new descriptive folder covering their product, Magnus Skin-Gard. Skin-Gard is a cream which, when rubbed into the skin, protects it against chemicals, solvents and dirt of all kinds. A copy of this folder will be sent upon receipt of the post card, page 97, with a check mark in the "C" square.

\* \* \*

The Johnson Bronze Co., New Castle, Pa., has issued a series of folders, each listing parts for one particular car. They cover Ford, Chevrolet, Plymouth and Dodge cars, and list connecting rod and main bearings, generator bushings, camshaft bearing, piston ring bushings, clutch pilot bushings, steering knuckle bushings, distributor and water pump bushings and starter bushings. Check the "D" square on the post card, page 97, for your copy.

**116C** LION AUTO PARTS & MFG. CO. offer the HY-POWER FACTORY DUPLICATE MUFFLER for your approval and your PROFIT. It's shown on page 116. For further details write or check postcard.

**117** The "KING" BATTERY CHARGER and "KING" EXHAUST GAS ANALYZER will put new blood into that service department. Investigate this line now. See page 117. Write ELECTRIC HEAT CONTROL CO. or check postcard.

**118A** G-E MAZDA offers a FREE copy of their folder on DRIVING and PASSING LAMPS (GLASEAL SYSTEM). A word to the wise serviceman is sufficient. See page 118. Ask your salesman or check postcard.

**118B** Speed up your tire repair service and build up those profits with SPEAKER MATCH PATCHES. Don't fail to read page 118. For further details write direct or check postcard.

**118C** With winter setting in, it's smart to have PAX-WELD on hand to take care of those cracked valve ports, cylinder heads or water jackets. It's shown on page 118. Write JOHN S. MCKENZIE or check postcard for details.

**118D** Save yourself time and money by using NOC-OUT HOSE CLAMPS made by the WITTEK MFG. CO. This handy and profitable item is shown on page 118. Write for details or check postcard.

**118E** VELLUMOID offers GASKETS for every use. With the VELLUMOID SHEET you can cut your gaskets as you need them, saving time and money. Don't miss page 118. Write direct or check postcard for details.

**118F** Along with a quality-profit line of WRENCHES, WILLIAMS offers a FREE BOOKLET this month on page 118. For complete information write direct or check postcard.

**118G** WARNER-PATTERSON offers you a free item . . . a RADIATOR DRAIN COCK OPENER with a purchase of their products. Read about it on page 118. Write direct for details or check postcard.

**118H** Faster, cleaner, more dependable work with high tensile strength can be performed with GARDINER FLUX-FILLED SOLDERS. Details on page 118. For complete line write or check postcard.

**118I** Are you selling the battery picked by engineers . . . GOULD? Stock the GOULD LINE and realize new profits on your investment. See page 118 for details. Write or check postcard.

**119A** Increase your winter profits with a cool, low-cost operating, longer-lived HANDY BATTERY CHARGER. It's shown on page 119. For further details write BALDOR ELECTRIC CO. or check postcard.

**119B** When you think of gaskets, oil seals, grease retainers . . . think of VICTOR. See page 119. Write or check postcard for complete details.

**119C** With the new LINCOLN KLEENSEAL LEVER GUN you can cut down on labor-time charges and pick up those extra profits. See page 119 for details. Write for literature on complete line or check card.

**119D** Play smart! Use PURITAN the genuine REFILL BRAKE FLUID that mixes with ALL others. See page 119. For complete information write direct or check postcard.

**119E** FITZGERALD GASKETS offer profit opportunities which you've never realized. Stock a supply and watch your gasket sales mount. See page 119. For further details write or check postcard.

**119F** GARDINER ACID-CORE SOLDER sets the service pace for quality and economy. Investigate today and don't fail to read page 119. Write direct for further information or check postcard.

**119G** Charlotte Southern visits a stadium this month to advertise SOUTHERN BRAKE LINING. Are you advertising it . . . and profiting from its sales? See page 119. Write or check postcard.

**120A** Your customers will appreciate the added gas saving they can obtain through your recommendation of BLUE CROWN SPARK PLUGS by MOTOR MASTER PRODUCTS CORP. See page 120. Write or check postcard.

**120B** When you have a customer for horns, you'll profit by remembering BUELL'S line and selling it. There's a note on page 120. Write for complete details or check postcard.

**120C** The new SPEEDWAY 1/2-in. No. 89 DRILL will handle that job quicker and more efficiently. See page 120. For further information write or check postcard.

**120D** WESCO DOUBLE SERVICE TIRE CHAINS are engineered to meet today's toughest driving conditions. Check on this profitable line today, shown on page 120. Write for details or check postcard.

**120E** For automobiles, trucks, trailers and buses . . . use TIMKEN BEARINGS. See page 120. For full details write direct, or check postcard.

**120F** Don't pay more . . . get VALLEY Battery Chargers. See page 120. Write for free bulletins, or check postcard.

**120G** Get that new equipment you need the logical, economical way . . . through COMMERCIAL CREDIT CO.'s "ONE-CONTRACT" AUTOMOTIVE EQUIPMENT PLAN. See page 120. Write for details or check postcard.

**121** For builders of business and good will . . . you can't beat NORMA-HOFFMANN PRECISION BEARINGS. Don't fail to check into story on page 121. For further details write direct or check postcard.

**122** Size for size TYSON CAGELESS BEARINGS offer twice the mileage of conventional cage-type bearings. And that means MORE AND BIGGER PROFITS for you. See page 122. Write for details or check postcard.

## CLASSIFIED ADVERTISING

LINES WANTED BY ORGANIZATION COVERING PENNA., SOUTH JERSEY, DELAWARE, MARYLAND AND D. C. CATERING TO PARTS JOBBERS AND VOLUME BUYERS. WE DO OUR OWN BILLING. SELLING BEST ACCOUNTS. HEADQUARTERS, PHILADELPHIA. ADDRESS BOX 702, MOTOR AGE.

**110**



**It Pays**

**-to Sell Foglites that are SAFE**

**It's A BEAUTY! . . .**

This new chrome-plated Glaseal Beam Foglite. Has malleable iron bracket and locking device that protects against pilferage. Genuine G-E unit. Special construction accommodates any Glaseal Beam unit regardless of thickness. 6 1/2" in diameter. Supplied with 10 feet of silver colored wire, plastic rotary switch. White or amber lens. No. 600, list \$5.00. Black enameled body. List \$4.40.

The "Grand" Foglite, No. 1000. Heavy chromium plated malleable iron bracket. Illuminated switch. White or amber lens. List \$5.00.

Extension Foglite Bracket, No. 603. Raises foglite 4" to clear high grille guards. Heavy malleable iron bolt. List 75c.

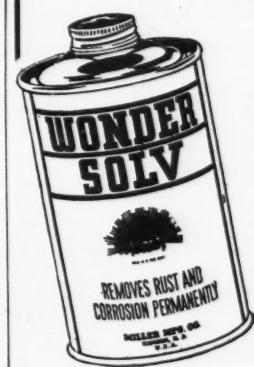
DO-RAY LAMP COMPANY  
1458 S. Michigan Ave. • CHICAGO

Ask Your Jobber  
About the Complete Line

**DO-RAY**

SAFETY LIGHTING AND REFLECTING DEVICES

**Time To Tune-up . . . Cooling Systems WITH Wonder Solv**



The new, scientifically prepared deoxidizing agent that permanently removes and prevents further accumulation of rust and corrosion in the cooling system of car, truck or tractor. WonderSolv is a pure, harmless vegetable compound . . . No chemicals . . . No alkalies, action is slow but positive. WonderSolv mixes readily with anti-freeze, works while you drive. Satisfaction guaranteed or your money will be refunded.

### WONDERWELD **QUICK ACTING . . . PERMANENT SEAL FOR CRACKED BLOCKS!**

It takes only 30 minutes to repair valve ports, water jackets, cylinder heads and inside cylinder cracks with Wonderweld. Gives a metallic seal that holds everlasting. Saves costly tear-downs.

To win the favor of your Customers always use Wonderweld. Guaranteed Products, try GASKETITE the all-in-one gasket compound for a vibration proof, pressure tight seal that never hardens . . . not affected by heat.



SEE YOUR JOBBER OR WRITE FOR FREE FOLDER  
MILLER MFG. CO., 1220 KAIGHN AVE., CAMDEN, N. J.

## Thermoid Employees Have Silver Dollar Pay Day

Wednesday, October 2nd, was Silver Dollar Pay Day for more than 1400 employees of Thermoid Company, Trenton, N. J.

On that day, all Thermoid employees received their weekly wages in silver dollars conveniently tied up in heavy canvas bags. These bags were tagged with the suggestion that employees spend the silver "cartwheels" locally and that, in making purchases, they ask local tradesmen and mer-

chants to keep the silver dollars in circulation. As a result, over \$40,000 (close to a ton and a half of silver dollar "cartwheels") were put into circulation in the Trenton trading area.

The purpose behind Thermoid's Silver Dollar Pay Day was to determine just where a factory payroll goes in a community. The silver dollars, which were obtained by special arrangements through a Trenton bank from the Federal Reserve, were chosen because their rarity afforded the best method of watching the payroll's flow.

To help answer the often-raised question as to where the money comes from which circulates in a community, where it goes and its influence on the business life of the community, the Trenton Chamber of Commerce cooperated with Thermoid in this unusual civic experiment. The Chamber of Commerce and local newspapers urged merchants to keep the silver dollars circulating by giving them in change to customers or by paying local bills with them rather than depositing the silver dollars in the bank. They also asked local merchants to report the number of the "cartwheels" received for one week following the Silver Dollar Pay Day.

The penetration of these silver dollars into every local artery of trade was quickly established. Landlords, grocers, bakers, department stores, insurance companies, druggists, theatres, lodges and even farmers have learned from the silver dollars they have received how important an industry, which manufactures products locally, is to them.

# Now! A better ROLLER BEARING for Front Wheels, Differentials and Rear Axles



## HERE'S THE BEARING REPLACEMENT YOU'VE ALWAYS NEEDED!

Designed to stand up longer under heavy service—to stay in perfect alignment under any combination of radial-thrust loads—that's why this Link-Belt roller bearing is certain to give greater efficiency. It's the ideal bearing replacement for front wheels, differentials and rear axles, because it assures increased bearing mileage and reduces operating costs. A trial installation will win your lasting confidence—ask your jobber about this better bearing today!

**LINK-BELT COMPANY**

519 N. Holmes Ave., Indianapolis, Ind.  
Warehouses in all principal trading centers

Made by the makers of the famous Silverstreak Silent Timing Chain!



All inner bearings are furnished with  
GREASE SEAL. Wrapped in oil  
paper and packed in individual cartons.



Left to right, C. H. McAleer, Bradley Higbie and Carlton M. Higbie.

Mr. McAleer will continue as president and treasurer, Carl J. Kennedy was named as vice-president, and Ernest Hummitch as secretary. The Canadian subsidiary, McAleer Manufacturing Company, Ltd., will continue under the direction of its present personnel.

Mr. McAleer states that plans for the future include an entirely new line of automobile finish products, backed by an aggressive sales and advertising program. A new product, with wide popular appeal, has been developed and tests in major car manufacturing plants have been conducted during the past two years. This new product will be introduced to the trade well in advance of the spring selling season.

Keeling & Co., Inc., of Indianapolis, has been retained as advertising and sales counsel.

**LINK-BELT**  
**SHAFER**  
**ROLLER BEARINGS**

See our EXHIBIT at the A.S.I.S., Spaces B-159-61-63-65

When writing to advertisers please mention Motor Age

ALL SIGNS SAY:

# Another Flying Start FOR HUDSON

HUDSON HAS REGISTERED THE  
**FASTEST SALES GAIN**  
OF ALL MAJOR COMPANIES!

Based on percentage of increase in new car registrations, January through August, 1940, compared with same period of 1939.

**MORE THAN 250 NEW DEALERS**

Have Joined Hudson Since the Start  
of the '41 Season...More Than 1275  
since the Start of the 1940 Season!

**SHIPMENTS OF 1941 MODELS  
ALREADY EXCEED ONE-THIRD  
OF TOTAL 1940 VOLUME**

Hudson Offers Fine Automobiles In Every Popular Price Class  
... New Hudson Six and Super-Six (in the lowest and low  
price fields); New Hudson Commodore Six and Eight and  
Commodore Custom (in the moderate price field). **MORE CAR  
for LESS MONEY** In Every Popular Price Class



The season just past was a banner one for Hudson . . . and everything points to 1941 as another big change-to-Hudson year. New dealers continue to join the organization at the rate of 4 or 5 every day. Both shipments and sales continue to climb. And, even more significant, Hudson dealers from coast to coast are being kept busy by buyers attracted by 1941's big new style idea . . . *Symphonic Styling*.

And this brilliant new styling is but one of many unique features and exclusive advantages that make every new Hudson not only a better car but a different *kind* of car from any other which the same amount of money will buy.

Full details about the 1941 Hudsons, and the 1941 Hudson franchise, await your request. Perhaps Hudson offers *you* the opportunity you've been looking for. Get in touch with us today.

PRICES START AMONG AMERICA'S LOWEST!

\$ **695**

for new 1941 Hudson Six Coupe, delivered in Detroit, including Federal taxes, not including state and local taxes, if any. Optional equipment and accessories extra. Low time payment terms. Prices subject to change without notice.

**HUDSON MOTOR CAR COMPANY • DETROIT, MICHIGAN**

**FATHER AND SONS.** Edsel Ford and his two sons Henry (left) and Benson (right), at the Ford exhibit of the New York Automobile Show. The third generation of Fords has joined the Ford Motor Co. this year. Edsel Ford said that the general upswing of business and an enthusiasm over the new models made him feel safe in predicting an increase of automobile sales.



## PROVED BY PERFORMANCE

### The Country Over

P & D Super Power Air Cooled Coils set new standards to meet

### The Challenge

To design a coil in the standard price range that will stand up under these 4 conditions:

- 1 Longer continuous runs
- 2 Higher compression
- 3 Higher operating temperatures
- 4 Freedom from burning and pitting of contacts

### The Solution

The P & D Super Power Air Cooled Coil which features:

- 1 Increased insulation of windings
- 2 Higher output
- 3 A 1-piece aluminum can with radiating fins
- 4 Balanced primary and secondary

With the plus advantage of two adapters with every coil making them universal and cutting down stock requirements.

Ask your jobber about them



**NEW TYPE** WIRE, CABLE, TAPE and  
NOKRODE BATTERY CABLE UNITS

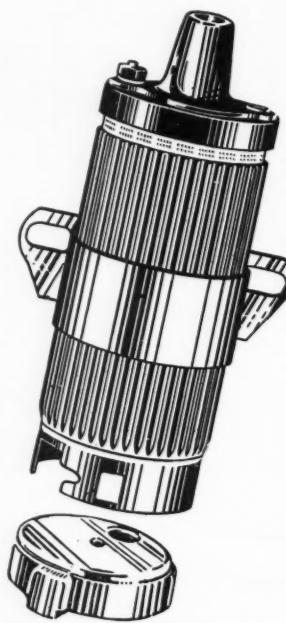
**P. & D. MANUFACTURING COMPANY, Inc.**

STARTING  
LIGHTING  
IGNITION

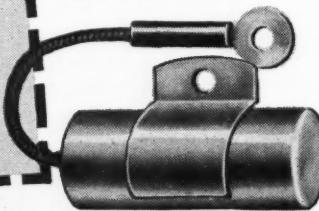
LONG ISLAND CITY  
NEW YORK

REPLACEMENT PARTS

P. & D. Manufactures ONE complete quality line. Only the finest materials and workmanship obtainable are employed.  
YOU CAN NOT PURCHASE ANY FINER QUALITY



New Heavy Duty Condensers, welded brackets and absolutely moistureproof are companion units to the new coils. Install both and be sure of peak performance.

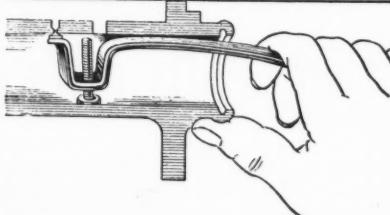
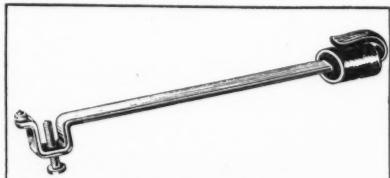


### Mid-Atlantic Jobbers Meet

Nearly fifty automotive jobbers from eastern states attended the fall convention of the Middle Atlantic Jobbers, at Atlantic City, N. J., last month. Featured speakers on the program were Martin Goldman, of The Aitkin-Kynett Company, Philadelphia advertising agency, Claude S. Klugh, manager of the Pennsylvania Automotive Assn., Frank G. Stewart, president of Motor and Equipment Wholesalers Assn., George D. Snook, of Hastings Mfg. Co. and B. W. Ruark, general manager of M.E.W.A. Association president Harry M. Woelfly, Reading, Pa., presided. Other officers are Harry V. Taylor, Wilmington, Del., vice-president and Edmund M. Deeter, Harrisburg, Pa., secretary-treasurer.

### Bypass Port Burring Tool

The Eis Mfg. Co., Middletown, Conn., has developed a hydraulic master cylinder bypass port burring tool designed to remove the sharp edge left on the inner end of the bypass



port after honing. The tool has an adjustable screw to accommodate different size master cylinders. List price \$1.00.

### New Christmas Cards

Good-Will Builders, 36 E. 23 St., New York, have announced an entirely new line of Christmas greeting cards designed for business concerns and business men. This year the cards have an historic background that recaptures the spirit of early America, the manufacturer states.

Why take chances with  
Brake Linings  
of unknown quality?



## "WE BUILD OUR REPUTATIONS WITH THE J-M 4 STAR LINE"

**SAY THESE EXPERIENCED SERVICEMEN:**



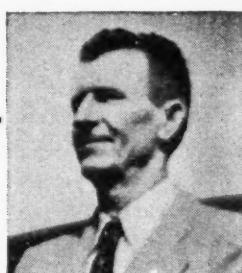
"I've been in automotive work since 1905. Today as always I recommend J-M because it gives universal satisfaction."

P. B. HURLEY  
P. B. Hurley Garage  
Riverside, Calif.



"When we opened a new brake department in our station, we decided to capitalize on the customer acceptance of the 'Oldest Name in Brake Lining.' No lines we have handled in our fifteen years of business have created more satisfaction than J-M."

PERRY G. COOPER, Cooper's Greasing Palace, Chicago, Ill.



"My reputation of over 20 years is at stake when I reline brakes. I have used J-M Linings more than any other kind."

J. W. FRAZIER  
J. W. Frazier's Garage  
San Antonio, Texas

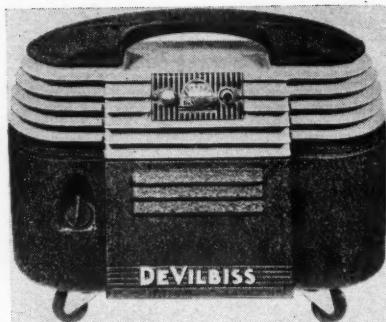
# JOHNS-MANVILLE

The Oldest Name in Brake Lining

J-M 4 Star, Standard & Fleet Tested Sets  
 J-M Woven, Folded & Molded Roll Linings  
 J-M Clutch Facings • J-M Brake Blocks

**Portable Air Compressor  
For Paint Spray Equipment**

A new portable air compressor for use with paint spraying outfits has been developed by The DeVilbiss Co., 300 Phillips Avenue, Toledo, Ohio. The compressor weighs 72 lb., is equipped with four rubber-tired swivel casters, and delivers 4.55 cu. ft. per minute at 45 lb. pressure. It holds the medium spray guns at from 32 to 40 lb., while maximum pressure is 50 lb. The new compressor is known as Type NKB, and is available



alone, or may be had with four different spray equipment assemblies.



Van Dorn Electric Sanders make an easy snap of one of the slowest, most tiring jobs a mechanic can face.

In a fraction of out-dated hand-work time, these speedy Sanders remove old paint, rust and scale; take off tar and dirt from under fenders; rub down lacquer—or perform dozens of other sanding operations that move jobs out of your shop fast—and that means profit today!

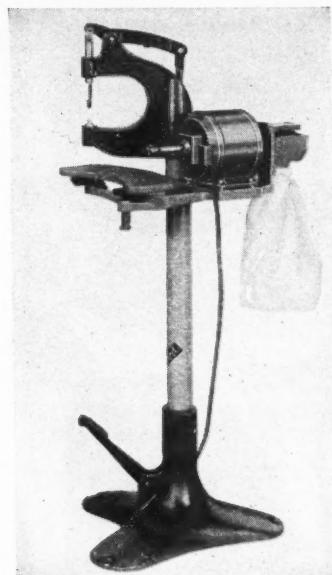
The Van Dorn Sander line includes 10 different model Sanders, Buffers and Sander-Buffers—for anything from intermittent to heavy-duty service. Ask your jobber for an "in your own shop" demonstration—or write Van Dorn Electric Tools, 727 Joppa Road, Towson, Md.



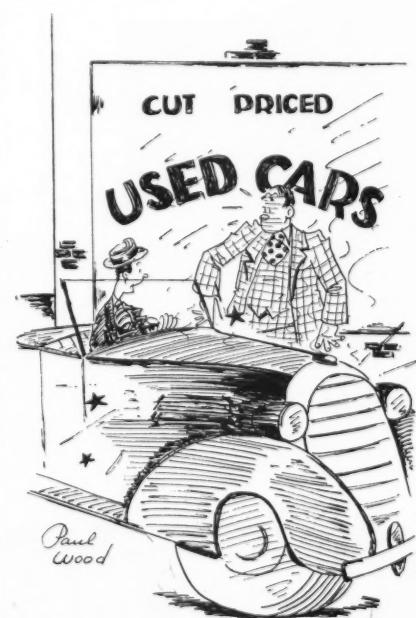
**"Van Dorn"**  
(DIV. OF BLACK & DECKER MFG. CO.)  
THE "RED HEADED" PORTABLE ELECTRIC TOOLS

**Grey-Rock Brake Reliner**

The United States Asbestos Division of Raybestos-Manhattan, Inc., Manheim, Pa., has announced its new model HF horizontal feed reliner. It is a complete unit consisting of the standard foot riveter with a direct drive countersinking and grinding unit mounted on the same pedestal.



The unit performs every operation necessary for complete brake shoe relining, according to the manufacturer; de-rivets the old lining, drills and counterbores the new lining on the horizontal drilling principle, and sets rivets with easy pedal pressure. A buffer for removing burrs around rivet holes and chamfering the ends of linings is conveniently located on the opposite end of the motor from the drilling tool. Trade price complete, \$39.75.



"You're the man who sold me this car two weeks ago. Tell me again what you said about it — I'm gettin' discouraged!"



"I'm afraid every knock isn't a boost for our service!"

## 2-Step Cooling System Service

The R. M. Hollingshead Corp., Camden, N. J., has announced two new products for cleaning and maintaining cooling systems. These two products are used in conjunction with each other, and comprise a 2-step cooling system service. First, the WHIZ Radiator Cleaner is used to remove rust and scale from the water passages so thoroughly that the manufacturer claims it is not necessary to reverse flush the system; then the WHIZ Rust Preventive is added to the cooling system solution to prevent



the formation of rust, sludge and scale. It is also said to seal and protect against minor leaks, and to be harmless to every part of the cooling system. These two products are twin-packed in an attractive, colorful carton for sale to the car owner and for handy use in the shop.

## Perfect Circle House Organ Wins N.I.A.A. Award

Each year the National Industrial Advertising Assn. sponsors an advertising exposition in conjunction with its annual convention.

Awards for outstanding advertising of member companies were presented in four classifications. In the house organ competition in this year's exposition (held in Detroit) two awards were made, one of them going to Perfect Circle's picture magazine for distributors and dealers, *The Magic Circle*.

The *Magic Circle* is published periodically in two divisions, one for Perfect Circle distributors and the other for the general repair trade.

## Welding Manual

The Hobart Bros. Co., Hobart Square, Troy, Ohio, has issued a manual containing lessons in arc welding for the beginner. It covers the subject in text book style with a large number of illustrations, and included welding with bare electrodes, welding and cutting with coated electrodes and welding light gage steel. The manual is priced at 50 cents.

★ Get This ATTRACTIVE Display Stand FREE

Plus Our Technical Bulletin Service and Sales Helps

Display Stand is 24" wide, 9 1/4" deep and 55" high overall—of sturdy all-welded, steel construction, set up ready for service. Beautifully finished in bright orange duco, with attractive metal sign at top and 4 shelves for systematic and attractive display of ignition parts stock.

ACT NOW and take advantage of this unusual combination Deal that will help stimulate your sales and increase your profit. MAIL COUPON BELOW.

To get you acquainted with NIEHOFF APPROVED QUALITY IGNITION PARTS and to enable you to share the experience of hundreds of repair shops and garages that are cashing in on this fast-moving parts line, we give you this attractive display stand ABSOLUTELY FREE with the purchase of a well-rounded stock of active moving parts, at a very small investment. Stock will enable you to service all popular makes of cars. In addition, we will give you without cost a most valuable Tune-Up Chart and other sales helps.

If you will qualify for our Service Agreement through your local Jobber, you will receive our technical bulletin service containing the latest authoritative data on motor Tune-Up. DON'T DELAY—ACT NOW!

Mail the COUPON TODAY for full details and learn how easily you can obtain this Profitable Combination Deal that will put EXTRA DOLLARS in your pocket.

MAIL COUPON TODAY

C. E. NIEHOFF & CO.  
4919 Lawrence Ave., Chicago, Ill.  
Please send full details telling how I can get this display stand FREE.

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_

STATE \_\_\_\_\_

LOS ANGELES, CALIF.

BRANCH: 1342 S. FLOWER ST.

**C. E. NIEHOFF & CO.**

4919 LAWRENCE AVE., CHICAGO, ILL.

BRANCH: 1342 S. FLOWER ST.

People want **WEEDS** with

# BAR-REINFORCEMENTS

WHEN A FAMILY CAR IS KEPT IN THE GARAGE BECAUSE OF ICE OR SNOW, WHO LOSES? LOOK IN YOUR MIRROR FOR THE ANSWER. WHEN YOU SELL WEEDS YOU MAKE A PROFIT AND KEEP A CUSTOMER. FOUR BIG SELLING POINTS -- BAR-REINFORCED CROSS CHAINS, WEEDALLOY METAL, HARDENED SIDE CHAINS, LEVER-LOCK END HOOKS. MADE BY AMERICAN CHAIN & CABLE COMPANY, INC., YORK, PA.



*In Business  
for Your Safety*

# WEED

AMERICAN  
Bar-Reinforced  
TIRE CHAINS



## Safety Authorities

declare winter  
doubles driving  
accidents and  
advise people to buy  
tire chains.  
Everybody knows  
Weed Chains.  
Easiest to sell on  
name and reputation.  
Put up your Weed  
Chain signs.



"Here's one that gets results! You press a button and it roars a blood-curdling 'Get outa the way!'"

### Vulcanizes Tires and Tubes

From Europe comes a machine which is claimed to vulcanize tires and tubes with a new process known as Stenorizing. Cuts, bruises and even holes in sidewall or tread of tires are quickly, automatically and permanently vulcanized, according to in-



formation supplied by Stenor, Inc., 72 Worth Street, Stamford, Conn., American representative. The vulcanizer is fully patented in this country as well as Europe, and will be marketed through regular jobbers.

### **Stewart-Warner**

#### **Service Schools**

The accessories division of Stewart-Warner Corp. has recently instituted on a nation-wide basis an accessory servicing training course. The purpose is to instruct automotive service station personnel in the authorized servicing of Stewart-Warner accessories. George Zahn, manager of the Stewart-Warner accessories division, said that experimental work on the

plan now in force covered a period of several months, and indicated that the "service clinics" have been instituted because of repeated requests for such instruction from service station operators throughout the country. The training course is available without cost to all authorized Stewart-Warner accessory representatives, Zahn said.

Under the new Stewart-Warner "service clinic" plan, "field men," all of whom are Stewart-Warner engineers, will cover the United States, holding service schools in designated areas for groups of service station employes. Individual instruction is

also available. Stock models of products to be serviced will be used to make the demonstrations practical and comprehensive. Models will be taken apart and assembled so that each feature may be thoroughly examined and explained.

All Stewart-Warner accessories, such as the speedometer, fuel pump, and tachometer, are included in the instruction program. Zahn stressed the fact that while the training is largely of a technical nature and does not incorporate a sales program, it does offer new methods for merchandising Stewart-Warner accessories.

## Service more cars quickly and profitably

—It's easy when you have one of these

**Shurhit**

### IGNITION ASSORTMENTS



Alert to the needs of the trade, SHURHIT scores again by introducing special dealer assortments of ignition parts. The *three new assortments* in the 5000 Series are designed to take care of the requirements of the car dealer who needs an assortment that will service cars other than those for which he is the dealer. For example—the assortment for the Ford dealer does not include any parts for Ford cars, but it does contain replacements to service cars equipped with Autolite and Delco Remy ignition.

#### No. 5000-A Assortment for CHRYSLER line dealers

Contains only replacements for DELCO REMY and FORD. Consists of fast moving numbers to service 90% of cars equipped with Delco Remy or Ford ignition system. List price, \$37.53 . . . Dealer's price, \$20.02.

#### No. 5000-D Assortment for GENERAL MOTORS line dealers

Consists of replacements to fit FORD cars, and cars equipped with AUTOLITE systems . . . List price, \$41.86 . . . Dealer's price, \$22.67.

#### No. 5000-F Assortment for FORD line dealers

Takes care of replacements on cars equipped with DELCO REMY and AUTOLITE systems. List price, \$42.00 . . . Dealer's price, \$22.42.

#### No. 4000 General Assortment for CHEVROLET, FORD, PLYMOUTH and others

Consists of 16 assorted sets of contact points, 14 rotors, 18 condensers, 13 sets of brushes, 2 coils, and 8 distributor caps. Complete in metal cabinet . . . List price, \$45.30. Dealer's price, \$24.79.

FOR DETAILS, see nearest Shurhit Jobber, or write us for FREE copy of catalog.

**CLIP and MAIL COUPON →**

#### SHURHIT PRODUCTS, Inc.

Waukegan, Illinois

Send details on Assm't No. . . . .

Send FREE copy of Catalog . . . . .

SIGNED . . . . .

FIRM NAME . . . . .

ADDRESS . . . . .

CITY . . . . . STATE . . . . .

NAME OF JOBBER . . . . .

# MOTOR AGE Editorial

## HOW'S BUSINESS

A MONTHLY REPORT ON MAJOR ITEMS BY 500 JOBBERS

OCTOBER, 1940

NATIONAL TOTAL			NATIONAL TOTAL				
	Good	Fair		Good	Fair		
<b>ACCESSORIES</b>			<b>TIRES</b>				
Fair			Poor				
Abrasives.....	50	104	23	Casings.....	7	48	33
Anti-Freeze.....	100	77	23	Tubes.....	13	69	28
Car Radio Sets.....	5	37	64				
Car Radio Accessories.....	4	33	65				
Chains.....	9	41	118				
Heaters.....	55	100	46				
Horns.....	8	55	98				
Lacquers.....	74	108	20				
Oil Filters.....	103	112	11				
Oils and Greases.....	21	81	38				
Polish.....	25	126	52				
Seat Covers.....	33	101	49				
Thermostats.....	49	103	50				
<b>REPLACEMENT PARTS</b>			<b>SHOP EQUIPMENT</b>				
Fair			Poor				
Axle Shafts.....	28	97	75	Battery Charging Equipment.....	43	98	46
Ball and Roller Bearings.....	75	118	21	Car Lifts.....	10	58	109
Brake Lining.....	86	118	22	Car Washers.....	5	27	132
Bushings.....	42	101	59	Compressors.....	19	83	80
Chains (Timing).....	13	109	82	Drills (Electric).....	30	110	61
Clutch Plates and Parts.....	88	97	21	Electric Testing Equipment.....	24	79	80
Fan Belts.....	122	94	15	Jacks (Garage).....	48	113	40
Gaskets.....	135	74	10	Lubricating Equipment.....	33	94	62
Gears (Rear Axle).....	19	107	74	Paint Spray Equipment.....	21	87	81
Gears (Transmission).....	27	123	50	Tire Service Equipment.....	3	33	113
Mufflers.....	152	67	4	Tool Kits and Sets.....	20	74	78
Pistons.....	44	121	42	Valve Retracers.....	14	70	99
Pins.....	53	122	36	Wheel Aligners.....	15	44	109
Rings.....	120	77	12	Wheel Balancers.....	14	55	101
Radiators and Cores.....	7	60	85	Safety Testing Equipment.....	5	41	111
Spark Plugs.....	121	94	12	Welding Equipment.....	28	73	80
Springs (Chassis).....	24	87	63				
Valves.....	56	124	26				
Water Pump Parts.....	100	98	11				
Engine Bearings.....	129	69	10				

### MOST ACTIVE LINES

October, 1940

1. Mufflers	152	12. Brake lining	86
2. Gaskets	135	13. Battery cables	81
3. Engine bearings	129	14. Other ignition parts	79
4. Fan belts	122	15. Lamps	75
5. Spark plugs	121	16. Ball & roller bearings	75
6. Rings	120	17. Lacquers	74
7. Oil filters	103	18. Ignition wire & cables	65
8. Anti-freeze	100	19. Coils	63
9. Water pump parts	100	20. Valves	56
10. Batteries	94		
11. Clutch plates & parts	88		

December, 1939

1. Mufflers	11. Oil filters
2. Engine bearings	12. Clutch plates & parts
3. Rings	13. Ball & roller bearings
4. Gaskets	14. Other ignition parts
5. Water pump parts	15. Brake lining
6. Spark plugs	16. Thermostats
7. Batteries	17. Ignition wire & cables
8. Fan belts	18. Anti-freeze
9. Cable (battery)	19. Heaters
10. Lamps	20. Lacquers

#### HOW ITEMS ARE RATED

'Most Active Lines' are chosen on the basis of the highest number of jobber reports indicating "Good" for the items selected among the twenty most active lines. "Activity" as used here has no bearing on volume, so the lists should not be interpreted as meaning the lines on which jobbers are enjoying the greatest volume. Most active lines are those which the greatest number of reporting wholesalers indicate are selling "considerably above normal" in their particular markets.

#### HOW TO READ THIS CHART

Information from which this chart is compiled is obtained monthly from a selected list of 500 wholesalers. Figures show the number of wholesalers reporting. Normal is taken as average sales for this month during the past few years.

Good—Sales considerably above normal.

Fair—Sales slightly above or below normal.

Poor—Sales noticeably below normal.

**FOLLOWING** is a brief digest of important articles appearing in this issue of MOTOR AGE. Read the digest and discuss the service procedure with your customers:

### CHEMICALS ADDED TO OIL

One of the most popular items in the jobber's stock today is special canned oil for internal engine cleaning. This article explains what is accomplished by using treated oils, and stimulates the demand for such products that can be administered by the repair shop to offset some of the conditions resulting from normal engine operation.

### SAFETY INSPECTIONS

This is a practical discussion of the multitude of service opportunities to be found in correct safety inspections. Prompts the mechanics to look for improper alinement and other steering faults, worn linings and dirty brakes, worn mufflers, battery cables, frozen brake cables, worn out wheel bearings, obstructed vision and bad lighting.



### WOMEN LIKE SUPER SERVICE

The hand that rocks the cradle is having more and more to say about the purchases of automotive service. Because she likes the "department store" idea in the purchase of household furnishings, clothing, and food . . . she goes for the super service idea in purchasing her automotive needs, too.



### UNDER-THE-HOOD WASHING

Chemically compounded products earn a place in the repair shop, and this story describes the use of them in cleaning dirt and grease from the outside of automobile parts. Cleaning compounds are only one of a long list of chemical products for the automobile service man now on the jobber's shelves.

# Highlights for JOBBERS

**L**IVING up to its reputation established over long years of service to the men who maintain America's motor cars, MOTOR AGE again brings a bookful of profitable and practical ideas for reader consumption.

**M**otor Age is designed and edited exclusively for automobile repairmen . . . the men who buy parts, accessories, supplies, tools and shop equipment from you and your salesmen. They are your best customers!

We want you to know Motor Age readers and know them well. That's why the editors of Motor Age bring you this regular monthly digest of important articles appearing in this issue. And you can profit by digesting this month's editorial offering. Here's how. Read the articles, discuss them in your sales meetings, and then adapt the service ideas to your sales approach in your daily contacts with the service trade.



## HOW TO COLLECT BILLS

It's swell to do a bang-up service job and it's good business to extend some credit cautiously—but the trick is to collect the dough and still keep the customer. In this article, a serviceman tells his fellow tradesmen how he does it, painlessly.

## SERVICING PLYMOUTH BODIES

To do a job on servicing passenger car bodies requires a lot of supplies in the form of making tape, dovetails, hinge pins, paint, body solder, etc. In this article on servicing Plymouth bodies detailed instructions are given to simplify such work.

## WINTER TUNE-UP

Here's a story that covers the jobber's stock from gaskets to batteries and anti-freeze. A complete check-up on the operations that should be performed to get the car ready for winter driving; generators, regulators, wiring, cooling system cleaning compounds, valve grinding and others—all call for replacement of items the jobber has for sale.

## RETREADING TIRES

Here is a subject in which the jobber is interested. Tire retreading equipment is not a 5 and 10 cent store item, and there are several shops in any given community who should be good prospects, to say nothing of fleet operators. Tire retreading is becoming increasingly popular, and the surface of demand has been only scratched.



## WATER PUMP OVERHAUL

Overhauling the packless type water pump calls for replacement of seals, shaft and bearing assemblies and gaskets. It also emphasizes the need for an arbor press and for gages to check clearances.

## TRANSMISSION SERVICE

Almost before the paint is dry on the new models, we present a story of servicing one of the major units of the 1941 Pontiac. It brings to the jobber's mind the use of transmission jacks, lubricants, creepers and special tools.

## HYDRAULIC BRAKE CYLINDER SERVICE

This service is a popular one with jobbers. It opens up the demand for brake fluid, hydraulic brake parts and special tools, and leads to brake relining jobs and brake drum turning.

## GRINDING LATHE TOOLS

A lot of grief is encountered in turning brake drums and in general lathe work as the result of dull tools. This article takes the mystery out of sharpening lathe tools.



Don't miss the big Automotive Service Industries Show, Navy Pier, Chicago, Dec. 9-14. The Pier has been made twice as wide and half as long to accommodate more manufacturer-exhibitors and more jobbers in attendance. A pier-ful of constructive merchandising ideas awaits you.



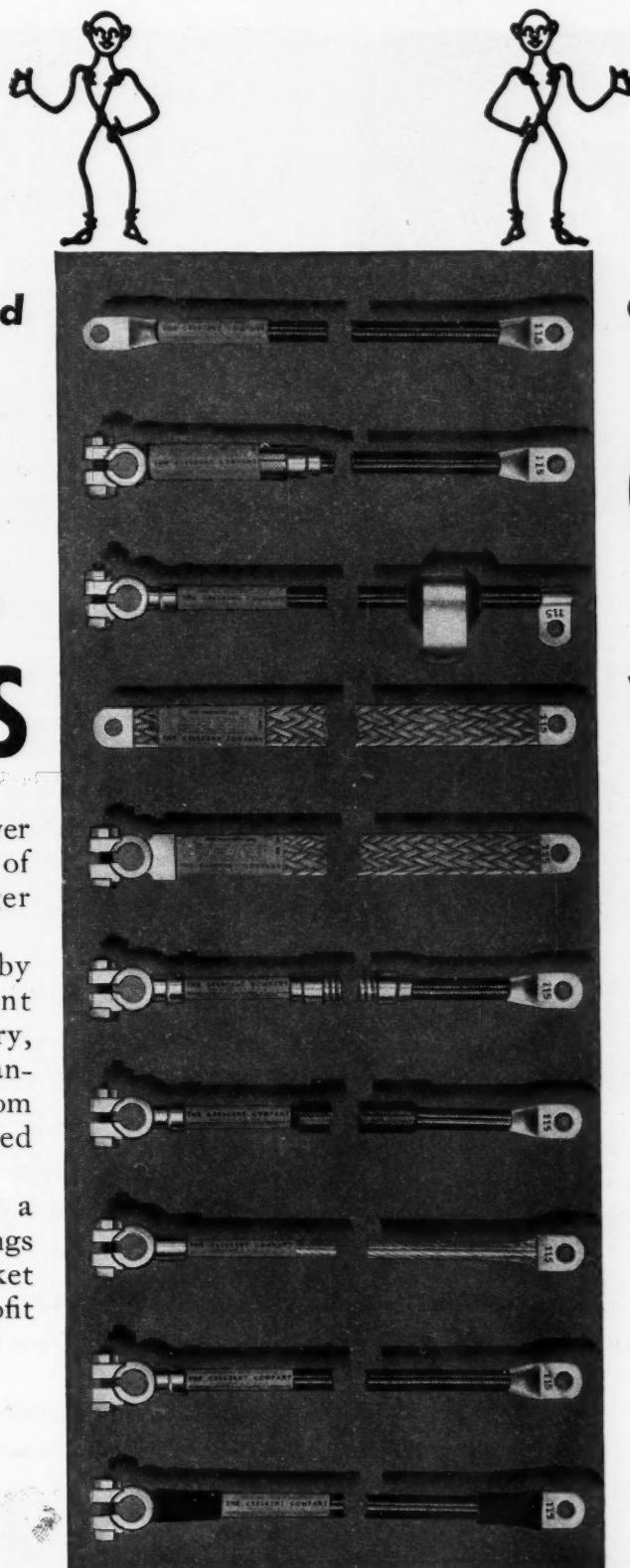
**New, 1941 Chilton Flat Rate and Service Manual—Largest and finest ever produced—will be off press on December 15th. Be sure the name CHILTON is on the Flat Rate you buy.**

**On the one hand**  
**YOU GET**  
**PRICE**  
**THAT GIVES YOU**  
**PROFITS**

There is only one answer to your increasing costs of doing business — longer profits.

Wiry Joe is produced by the biggest independent company in the industry, with direct control of manufacturing processes from copper rods to finished products.

This makes possible a price schedule that brings you the big, mass market . . . at a consistent profit to yourself.



**On the other hand**  
**YOU GET**  
**QUALITY**  
**THAT HOLDS CUSTOMERS**  
**AND BUILDS**  
**VOLUME**

You don't often find a top quality line at volume-market prices. Wiry Joe is one of them.

There's an eye-catching sales appeal and topnotch performance built into every item in the complete line.

You'll find that Wiry Joe provides you with the product quality you need to build customer satisfaction and profitable volume.

Every heavy-gauge battery cable in the complete Wiry Joe line has lustrous, black lacquered insulation . . . heavy terminals that prevent bottle necks in the flow of current.

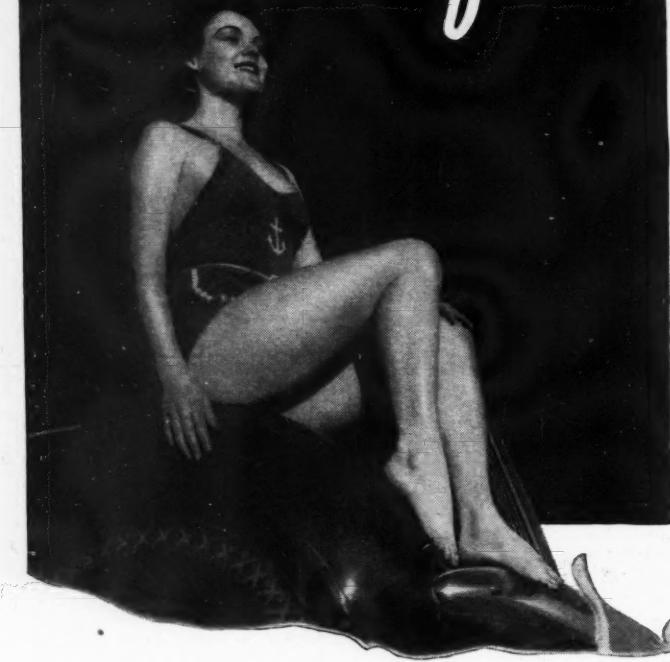
*Wiry Joe*

**AUTOMOTIVE WIRING**  
**PRODUCED BY THE**

**DOSTAM METHOD**  
**BY**   
**THE**

**CRESCENT CO. - Pawtucket, R. I., U. S. A. - Montreal, Canada**

# The Body Beautiful!



Many car owners take the same pride in the sleek, trim lines of their automobiles that the bathing girl takes in hers. And wise repair men know there is big money in car-body work—*when it's done right*.

The secret is in the solders used on broken fenders and dented bodies. Kester Body Solder are famous for this type of work. They're made of virgin alloys of highest grade. When used in a spray-gun they do less clogging and atomize to a finer division. When paddled, they provide a longer working range. You'll make quality repairs every time with Kester Body Solder.

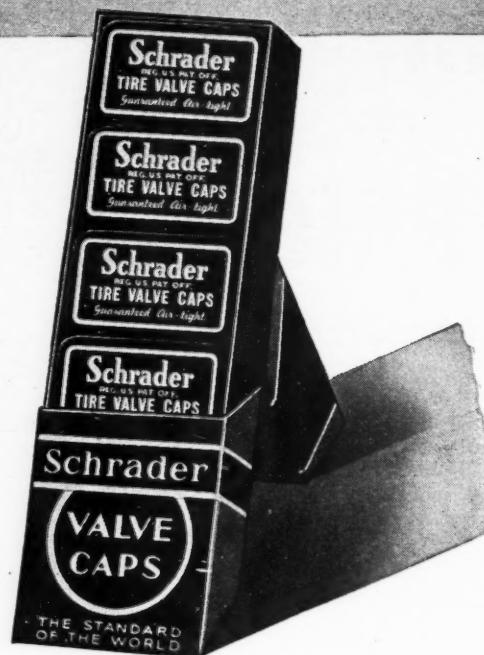
The word gets around when you turn out this kind of work. Your shop stays busy and profits increase in a hurry.

Order Kester Body Solder today—Cored for tinning, Solid for filling—and get your share of this money-making business.

**KESTER SOLDER COMPANY**  
4242 Wrightwood Avenue Chicago, Illinois  
Eastern Plant: Newark, N. J.  
Canadian Plant: Brantford, Ont.

**KESTER**  
**BODY SOLDERS**

## STANDARD EQUIPMENT TIRE VALVE CAPS IN REPLACEMENT PACKAGES



This package of 50 valve caps (10 metal boxes of 5) exactly fits the buying habits of the great majority of dealers. The caps come right from our regular production for original equipment . . . individually inspected . . . same high quality tire manufacturers specify. Order first-line Schrader Valve Caps in these handy stock-control packages from your regular source of supply.

### Popular Styles of Caps Available in this Replacement Package



No. 880



No. 935



No. 7960

Schrader Valve Cores are also sold in the same type of display package of 50 and 100.

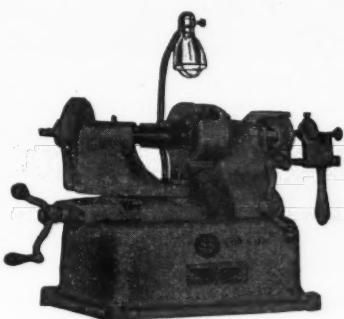
**Schrader**  
REG. U. S. PAT. OFF.  
**TIRE VALVE CAPS**

A. SCHRADER'S SON BROOKLYN, N. Y.  
Division of Scovill Manufacturing Company, Incorporated

# BUSINESS As Usual



**VR-7 VALVE REFACING MACHINE**



For wet or dry grinding. 2 motors. Finishes valve faces smoothly, speedily and accurately. Furnished fully equipped.

★ **N**ATURALLY, we're doing our part in the defense program.

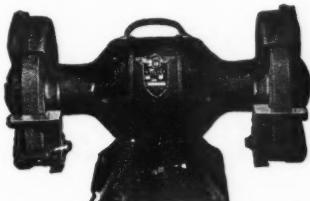
## UNITED STATES ELECTRICAL TOOLS

are serving our flag . . . but

**CONSUMER GOODS ARE BEING GIVEN EVERY  
CONSIDERATION AND PROMPT ATTENTION.**



**STANDS READY TO  
SERVE YOU FAITHFULLY  
AND WELL.**



**6" BENCH GRINDER**

For general purpose grinding and for edge tools. Continuous service. Totally enclosed motors. With safety eye shield and adjustable lamp, if desired.



**7" PORTABLE SANDER**

General purpose sander. High speed. Light weight. Streamlined. Straight line ventilation to prevent clogging and assure cool motor operation. Air outlet diverts dust from operator. Flexible rubber pad for flat or curved surfaces.



**5/8" HEAVY DUTY  
DRILL**

Super-powered. For driving portable cylinder holes and heavy production. Ball bearing. Chuck spindle mounted in two radial thrust bearings. Chrome nickel steel gears, heat treated, packed and sealed in grease.

We favor an adequate preparedness for National Defense  
and recommend enlistment to eligible young men.

**THE UNITED STATES** **ELECTRICAL TOOL CO.**

CINCINNATI,



OHIO, U.S.A.



## Clean BODY LUBRICATION WITH DOOR-EASE

Body lubrication is an essential feature of every thorough lubrication job... and it makes a hit when customers see that you use DOOR-EASE Products for this purpose. DOOR-EASE lubricates without danger of soiling clothing or car upholstery.



...by the makers of RUGLYDE Penetrating Rubber Lubricant.

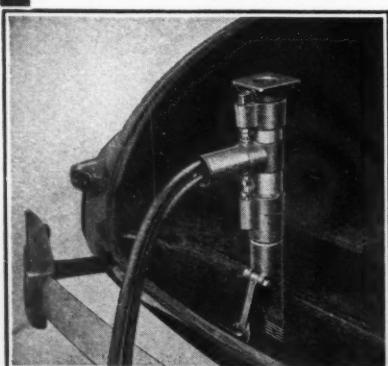
AMERICAN GREASE STICK CO., MUSKEGON, MICH., U. S. A.  
Canadian Sales Representatives  
COLONIAL TRADERS, Ltd., 144 FRONT STREET W., TORONTO



IT PAYS  
FOR ITSELF  
on the FIRST  
6 JOBS  
The H-289

Perfection Power Plus

### UNIVERSAL FENDER SPREADER



Ideal for close work where wide spreading is necessary, and for spreading between fender and fender well. Closes to 1 3/4" and opens to 19 3/4" with 6" ram travel.

Models H-289  
Price \$12.50

H-80 Perfection Power-Plus Push-Pull Spreader. (For use only with Perfection Push - Pull Jack.) Power in a small area. Ideal for trunks, pushing out sills, etc. Will fit into 1" space. Open width 5 1/2".

Price \$8.50  
Order at once through your jobber.

G. A. C. Mfg. Co.  
ASHLAND, OHIO

## Are You Missing a Bet?



L & H Wheel Balancing Weights

EVER think of the extra profits you could be making if your shop were equipped to balance wheels? Practically every car that comes into your shop needs this service. L & H Balancing Weights are being installed to the tune of millions a year. Why not get your share of this business? Write and get the low-down! (Pat. No. 2036757.)

HARLEY C. LONEY CO.  
16883 Wyoming  
Detroit, Mich.

Write for Literature.



## Degreaser Concentrated!

Beware of Partly Diluted Imitations

Some stores may use the name of Gunk loosely to identify Inferior Products — Don't Be Fooled — If the degreaser does not bear the Gunk nameplate, it is not Gunk and... will not offer you the advantages of Gunk... such imitations should be flatly refused. Free Carburetor Cold Tank FORMULA TO GUNK USERS ON REQUEST.

A. F. CURRAN, MALDEN, MASS.



Maintenance Men  
who read  
**MOTOR AGE**

Account for  
**85% plus**

of all the business  
done in this  
Important Field



*America's Most Popular Guards!*

**ERIE**

*Custom Built*

**GRILLE GUARDS for 1941 CARS**

Super DeLuxe Ford      Buick      Studebaker Champion  
 DeSoto      Mercury      Hudson  
 Chevrolet      Plymouth

Erie's famous line of grille guards is now complete for 1941 cars. Besides the custom built models, we feature universal guards for most other 1941 cars. Write today for complete particulars.

**ERIE MANUFACTURING CO.**  
 INCORPORATED  
 815-23 SO. WABASH AVENUE • CHICAGO, ILL.  
 Made in U.S.A.

NEW LIGHT ON YOUR CLEANING JOBS

**WINTER-CLEAN GREASY FLOORS  
THIS EASIER OAKITE WAY**

How grease, dirt and muck seem to "pile up" on garage floors . . . especially in Winter months!

Yes . . . you have to get rid of these deposits, but don't try to use costly, ineffective and dangerous volatile "cleaning" fluids for the job! Instead, put SAFE, low-cost OAKITE PENETRANT to work for you. No obnoxious fumes . . . no explosion hazard. But plenty of powerful, time-saving cleaning action! Heavy deposits are removed without hard manual scrubbing. Floors are CLEAN . . . safe to walk on.

Write for FREE 36-page booklet chock-full of money-saving cleaning data for your shop.

*Manufactured only by*  
**OAKITE PRODUCTS INC., 24C THAMES ST., NEW YORK, N. Y.**  
 Representatives in All Principal Cities of the U. S. and Canada

**OAKITE**  
*Certified* CLEANING

MATERIALS & METHODS FOR EVERY CLEANING REQUIREMENT

**Give Your Customers REAL Light Satisfaction**

**SELL**

**U-AD-CO Fog Lamps for**

- Greater Safety!
- Quicker Sales!
- Bigger Profits!

With the coming of fall and winter months, night driving, with all its hazards, including fog, will force motorists to seek more adequate lighting. If you are stocking the U-AD-CO line, you will be in a position to take advantage of this profitable business.

The U-AD-CO Fog Lamps are equipped with Mazda All-glass amber lamps. Brackets are of steel, Chromium plated, with universal adjustment, and are supplied with theft proof nuts and bolts. These and other features assure customers satisfaction. No. UAL-125 Single. No. UAL-125A in pairs, with fuse control switch.

Scientifically designed to suppress to a minimum the scattered light above the main beam, directed to right side of road below eye level.

Don't overlook this BIG Profit Opportunity. Write or wire **NOW** for complete details. Also the new U-AD-CO Sealed Beam Adapter Kits for Pre-1940 cars are proving to be the Hottest Replacement Item in years. Address Dept. M.A. for full information.

**U-AD-CO AUTOMOTIVE DEVICES CO.**  
 1018 SOUTH WABASH AVE., CHICAGO, ILL.

**"I CAN GET IT QUICKLY BY  
RAILWAY EXPRESS!"**

MANAGER

Tell your customer that and you'll make both a sale and a friend. RAILWAY EXPRESS specializes in top-speed service for America's motor trade — with fast, through trains — speedy motor vehicles — prompt pick-up and delivery in all cities and principal towns without extra charge. By specifying "SHIP BY RAILWAY EXPRESS" you'll get orders refilled fast — and make profits and friends. Our rates are low. Our service is nation-wide.

For super-speed use AIR EXPRESS  
 3 miles a minute — Special pick-up — Special delivery

**RAILWAY EXPRESS**  
 AGENCY  INC.  
 NATION-WIDE RAIL-AIR SERVICE

**"Washing time Reduced by 1/2"**

**"Rinse water 'sheets off.' No chamoising"**

**"No streaks or water marks Cars look like they'd been waxed"**

**AUTOMOTIVE PERFORMANCE DATA**

**DEDICATED TO  
The Auto Man  
FOR THE PARTICULAR  
NEEDS OF  
The Ford Motor**

**MAGNUS CHEMICAL COMPANY  
Garwood, New Jersey**

**WRITE FOR YOUR COPY NOW**

**Practical Ideas on  
Economical Body Washing  
with  
MAGNUS NXL**

When you wash a car—particularly for resale—you want to get a clean streakless surface with the least time, effort and cost of cleaner. That's why you will be interested in these performance reports on Magnus NXL—the new body cleaner that is revolutionizing car washing practice and costs. It also contains similar reports from users of other Magnus Automotive Cleaning Specialties, describing the results they are getting compared with formerly used methods and materials.

**MAGNUS CHEMICAL COMPANY**

Manufacturers of Cleaning Materials, Industrial Soaps, Metallic Soaps, Sulfonated Oils, Emulsifying Agents and Metal Working Lubricants.  
174 South Avenue

**Garwood, N. J.**



**MAGNUS CLEANERS**

**Batteries Get Posted**

B. F. Morris, vice-president, and A. A. Manchester, Division Sales Manager of Thomas A. Edison, Inc. have launched an intensive fall battery campaign with colorful posters which tie in with display material furnished to every Edison dealer.

**Opens Washington Office**

Nash Kelvinator Corp. has announced the opening of a Washington, D. C., office and the appointment of Campbell Wood as assistant to the president and director of the capital office.

**McAleer Rubbing Compound**



The McAleer Mfg. Co., 2431 Scotten Avenue, Detroit, Mich., has announced a new rubbing compound known as Quix compound. Said to be manufactured from the finest of raw materials available, and under laboratory control to insure uniform quality, the new rubbing compound is backed by the manufacturer's 20 years' experience in furnishing polishing and rubbing compounds to the automotive trade.

**Removes Regulator Cover**

The cover of the voltage regulator used on the Ford car is riveted to the regulator. It is necessary to remove the cover to regulate the cut-in voltage, and this is possible with the new



tool announced by the Tool Equipment Co., 1040 West Fort St., Detroit, Mich. This tool removes the rivet holding the cover, and inserts a new rivet when the job is completed. This eliminates the use of chisel or files, the loosening of wires, and the removal of the regulator to the bench. While this new tool will do this job on all Auto-Lite voltage regulators, it will also apply to installing new hood lacing, etc.



Champions of the Y. M. C. A. Industrial league, the Standard baseball team is made up entirely of employees of Standard Motor Products, Inc., Long Island City, N. Y., ignition parts manufacturers.

**RETREADS**



**"EYE APPEAL"  
Means "AYE! APPEAL"**

Offering "eye appeal" as well as complete reliability in service, SKINNER RETREADS bring out a chorus of "Ayes!" from those car owners who are hard to satisfy. Point out SKINNER RETREADS' EXTRA mileage and SAFETY . . . at a price to fit any purse. Write today for full details.

**SKINNER TIRE & RUBBER CO.  
Springfield, Ohio**

**SKINNER**

**HYPOWER**  
Factory Duplicate MUFFLERS

At All Good  
Jobbers



Write for  
Our New 1941  
Muffler Catalog

**LION AUTO PARTS & MFG. CO., INC.**

1920 S. Michigan Ave. 2214-20 Main St. 1239 Osborne St.  
CHICAGO DALLAS MONTREAL

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACTS OF CONGRESS, OF AUGUST 24, 1912, AND MARCH 3, 1933

OF MOTOR AGE, published monthly at Philadelphia, Pa., for October 1, 1940.

State of Pennsylvania } ss.  
County of Philadelphia }

Before me, a notary public in and for the State and county aforesaid, personally appeared Joseph S. Hildreth, who, having been duly sworn according to law, deposes and says that he is the Business Manager of the MOTOR AGE, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, Chilton Company, Chestnut & 56th Sts., Phila., Pa.; Editor, W. K. Toboldt, Route 1, Chester Springs, Pa.; Managing Editor, none; Business Manager, Joseph S. Hildreth, 63 Overhill Rd., Bala-Cynwyd, Pa.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.) Chilton Company, Chestnut & 56th Sts., Phila., Pa.

Holders of more than 1% of the capital stock outstanding of Chilton Company: C. A. Musselman, 260 Sycamore Ave., Merion Station, Pa.; F. C. Stevens (deceased), 325 West End Ave., New York, N. Y.; J. S. Hildreth, 63 Overhill Rd., Bala-Cynwyd, Pa.; G. H. Griffiths, 165 Montclair Ave., Montclair, N. J.; Charlotte M. Terhune, 160 E. 48th St., New York, N. Y.; John Blair Moffett, 1608 Walnut St., Philadelphia, Pa.; Wm. A. Barber, 182 Summit Lane, Bala-Cynwyd, Pa.; C. S. Baur, 76-66 Austin St., Forest Hills, N. Y.; J. H. Van Deventer, 12 Phillippe Place, Yonkers, N. Y.; P. M. Fahrenzorff, 19 Tunstall Rd., Scarsdale, N. Y.; Dorothy S. Johnson, 1327 N. Greenway Drive, Coral Gables, Fla.; Anne E. Tomlinson, c/o Bankers Trust Company, P. O. Box 492, Grand Central Annex, New York, N. Y.; Ethel G. Breen, Trustee u/w of Charles W. Anderson, 51 East 42nd St., New York, N. Y.—Beneficiaries: Robert C. Anderson, Pereival E. Anderson, Charles W. Anderson, Jr., Annie L. Clark; John Blair Moffett, 1608 Walnut St., Philadelphia, Pa.—Agent for J. Howard Pew, J. N. Pew, Jr., Mabel P. Myrin, Mary Ethel Pew; Elizabeth J. Bailey and Ellwood B. Chapman, Trustees of James Artman, Deceased, 930 Real Estate Trust Building, Philadelphia, Pa.—Beneficiaries: Franklin Artman, Vera Watters, Alvin C. Artman, Elizabeth J. Artman, Marion A. Pratt, George H. Pratt, by assignment, Edwin Moll, by assignment; Bankers Trust Co. and Wilfred T. Pratt as Trustees u/w of Eugene Sly F.B.O. Beulah B. Sly, P. O. Box 704, City Hall Station, New York, N. Y.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed through the mails or otherwise, to paid subscribers during the twelve months preceding the date shown above is 10,000. (This information is required from daily publications only.)

JOS. S. HILDRETH, Pres. & Business Manager.  
Sworn to and subscribed before me this 20th day of September, 1940.

JOSEPH W. FRITZ  
(My commission expires Feb. 19, 1943.)  
[SEAL.]

## Production Outlook

Automobile plants in the Detroit area, aided by assembly plants in various parts of the country, hit a three-year high during October when an estimated 495,000 motor cars and trucks rolled off the production lines. This is the largest month's output since the booming year of 1937, when June production was 521,153 units. It also will go down as the largest October production in the industry's history and tops the best previous month of 1940 by more than 40,000 units.

After a cleanup period in which dealers disposed of most everything in the showroom down to the last floor model, sales of the 1941 creations are proceeding at a brisk rate. For the first 10-day period in October, five divisions of General Motors more than doubled their 1939 sales for the same period, reporting a gain of 132 per cent as they retailed 55,572 motor cars and trucks. Sales of Buick and Oldsmobile for the period set all-time highs.

Eighty-five hundred Ford, Mercury and Lincoln-Zephyr dealers reported their new and used car inventories at the lowest level before the new model introduction since a close factory check of such stocks was begun in 1934.

September new passenger car sales held up well despite the Conscription bill and its possible adverse effect upon installment sales. Although it is rated the poorest selling month of the year, new passenger car sales rose 13.1 per cent over 1939 during September.

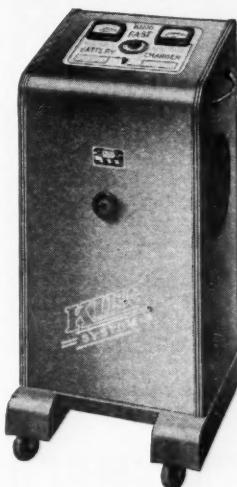
Although plant expansion for National Defense work in the Detroit area is barely getting under way, there already is a shortage of labor in certain skilled occupations. This in spite of the fact that there were 218,669 applications for unemployment compensation in the state's files as of Oct. 15. The Michigan Unemployment Compensation Commission has found shortages of machinists, lubrication men, upholsterers, metal polishers, arc welders, architectural draftsmen, foundry molders, cutter and tool grinders.

Work is now under way on the new Packard and Ford aircraft engine plants and the Chrysler tank arsenal. When these plants are completed some time next spring or summer, they will require more than 30,000 workers. Ford already has started an apprentice training school for its aircraft engine division, enrolling some 2000 carefully selected youths, among them Henry Ford, II, and his brother Benson, grandsons of Henry Ford.

## Motor Piston Ring Moves

Motor Piston Ring Co., formerly Ace Piston Ring, makers of Kup-Lox piston ring since 1932, has moved its factory to New Haven, Ind., from Spooner, Wisc. Production is under supervision of H. Bert Hopper, designer and inventor of the rings.

CHARGE BATTERY  
IN CAR  
WITH  
The "KING"  
FAST Battery Charger



MAKE  
MONEY  
ON QUICK  
CHARGING  
•  
SOLD ON  
DEFERRED  
PAYMENTS  
•

You can make money with the "KING" FAST Battery Charger. It will charge one battery in the car and can also be used for charging a line of batteries in the regular way. Charging may be done while car is being lubricated, washed, or in for repairs. It will charge one battery at an 80-ampere rate, tapering off. The rectifying element is the efficient long-lived copper sulphite type and will give years of satisfactory service. An ammeter permits setting at correct charging rate, and a voltmeter is for testing batteries before charging. An accurate time switch shuts off charger at any desired time up to 60 minutes. The cabinet is a beautiful modernistic job with chrome trim. Only requires 18" x 20" floor space. The "KING" FAST Battery Charger is a high-quality unit and sells for \$178.00 complete with cables, etc.

GET MORE MILES PER GALLON  
with "KING" ONLY \$34.  
EXHAUST GAS ANALYZER



The "KING" Exhaust Gas Analyzer can be used to reduce your customers' gas consumption and make you a profit. It is simple to operate—quick acting and accurate. Meter indicates both air fuel ratios and percentage of combustion indicating lean, idling and rich. We can also supply a combination R.P.M. Indicator, Cam Angle Tester and Exhaust Gas Analyzer.

Ask our Jobber or Write us Jobber's Name

The ELECTRIC HEAT CONTROL CO.  
9123 INMAN AVE.—CLEVELAND, OHIO  
KING—Good Products Since 1914—KING

FOR FREE COPY  
new folder on  
Driving and  
Passing lamps  
(Glaseal System), ask your  
G-E distributor's salesman!

TRIPLE THE LIGHTING  
On the Average Pre-1940 Car

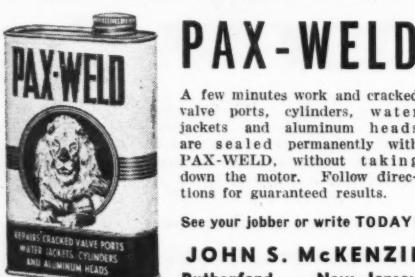
**G-E MAZDA AUTO LAMPS**  
GENERAL ELECTRIC

## SPEAKER MATCH PATCHES

The Name for GUARANTEED Vulcanized Tube Repairs. Wick Fuse lights INSTANTLY. Each Patch Hermetically Sealed in Pliofilm. At Jobbers Everywhere.

**J. W. SPEAKER CORPORATION**  
1661 North Water Street  
Milwaukee, Wisconsin

A PERMANENT SEAL with . . .



TRADE MARK  
**NOC-OUT**  
HOSE CLAMPS

THE HOSE CLAMP  
WITH THE  
THUMB SCREW



"Now, which tooth is it  
you want out?"

### Heads Service Managers

Walter (Speed) Taggesell, service manager of the Wolfard Motor Company, Ford dealership, is new president of the Service Managers club of the Automobile Dealers association of Portland. Elected vice-president of the group Taggesell was elevated to the presidency during the past month. Bill Barnes, service manager of the Roy Burnett Motors, DeSoto and Plymouth distributors, is secretary.

### Moves Headquarters

Factory representatives for companies supplying bearings to the automotive replacement trade, Edward D. Maltby Co., has removed its quarters to its own building at 1718 South Flower St., Los Angeles.

The firm acts as factory representative for Marlin-Rockwell Corp., Jamestown, N. Y.; Shafer Bearing Co., Chicago; American Roller Bearing Co., Pittsburgh; Roller Bearing Co. of America, Trenton, N. J., and the Chicago Rawhide Manufacturing Co., Chicago, Ill. In addition, this company is a distributor of Timken Tapered Roller Bearings to the automotive replacement trade.

### SEND FOR FREE BOOKLET

"How to Select and Use Wrenches"—a gold mine of information for every serious-minded user or specifier of wrenches.

**WILLIAMS**  
SUPERRENCHES  
SUPERSOCKETS

J. H. Williams & Co.  
225 Lafayette St.,  
New York, N. Y.



**GET THIS  
FREE!**  
NEW RADIATOR



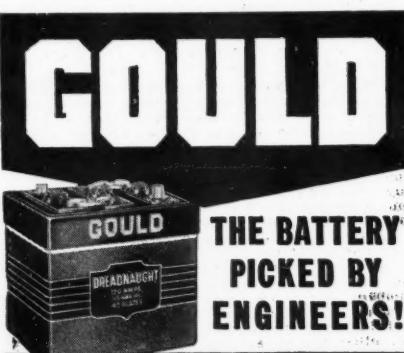
**DRAIN COCK OPENER**  
... to speed up work—and PROFITS—on Cooling System Service! Opens practically all Radiator Drain Cocks... a real Profit Booster on Anti-Freeze business.  
**ORDER NOW**

**WARNER-PATTERSON CO.**  
920 S. Michigan Avenue • Chicago, Illinois



The unchallenged leadership of Gardner Flux-Filled Solders is due to the faster, cleaner, more dependable work assured by their high tensile strength, quick-acting flux and uniform quality. Line includes Solid Wire, Bar and Body Solders, and Permanent Lining Babbitt Metal.

Complete display at A.S.I. Show in Chicago—Space B-96



FOR THE OIL GASOLINE & WATER CONNECTIONS  
**VELLUMOID**  
VELLUMOID

Cut or Tap Out VELLUMOID  
Gaskets as You Need Them

No delay—and VELLUMOID Gaskets stand the gaff of the hardest service.

Sold through Jobbers. The Vellumoid Co., Worcester, Mass.

# Handy

## BATTERY CHARGERS

### INCREASE YOUR WINTER PROFITS!

New, improved ventilation—cool, low-cost operation and longer life. 2 yr. GUARANTEE. Get Bulletin 74 \$2.40 on Complete Line. A right: 6-Batt. Size less bulb.

BALDOR ELECTRIC CO.  
4375 Duncan Ave.,  
ST. LOUIS, MO.



For Seals of Security

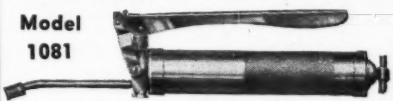
Industry depends on

# VICTOR

GASKETS, OIL SEALS, GREASE RETAINERS

### New LINCOLN KLEENSEAL LEVER GUN

Model  
1081



Price only \$4.00

Ask your Lincoln Jobber salesman, or write us for details on Model 1081 and other items in complete line which includes hand guns, lever guns, air and electric operated lubricant dispensing units, and full line of grease fittings.

LINCOLN ENGINEERING COMPANY  
General Offices, St. Louis, Mo.

### Play Safe! Use Only



# PURITAN

The Genuine REFILL  
BRAKE FLUID

Mixes with ALL Others

Distributed through N. A. P. A. Warehouses

# YOU'LL NEVER KNOW

THE PROFIT OPPORTUNITY in Fitzgerald Gaskets until you handle them.

THE FITZGERALD MFG. CO., TORRINGTON, CONN.

# FITZGERALD

## GASKETS

### N.A.D.A. Executives on Tour

Stanley H. Horner and Walter E. Blanchard, president and manager, respectively, of the National Automobile Dealers Assn. have started on a trans-continental tour by motor which will include speaking engagements in states from West Virginia to California.

It is the first time that N.A.D.A. has adopted this means of making personal calls on affiliated dealer organizations and state directors of N.A.D.A. The purpose is to bring the activities of N.A.D.A. to the nation's dealers at first hand, and to make these activities more effective by stimulating the organization of more local dealer associations.

The trip will cover a month's time, and talks began with the convention of the West Virginia Automobile Dealers Assn. at Clarksburg, October 17, and will end with the convention of the Minnesota Automobile Dealers Assn. at St. Paul, November 13.

### Catalog Helps Sales

A ready answer to car owners who think that there is no longer a need for tire chains, is given on the cover of the new Weed Chain catalog. A large snow map depicts the number of times it snowed last winter and the average depth of snow for each State. Drivers can discover just how widespread snow conditions actually were. This information gives the dealer ammunition with which to meet customer objections—puts forward a strong, forceful picture of the need for chains during the winter months—helps the dealer to bring up the subject of tire chains, by talking about last year's snow conditions.

On the inside pages of this 16-page catalog are given some straightforward selling tips plus a good line-up of the complete Weed Chain line.

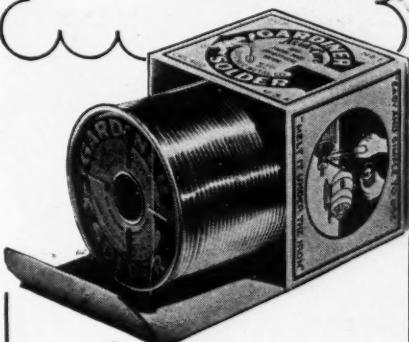
Copies are available through American Chain & Cable Co., Inc., Bridgeport, Connecticut. Ask for DH-4 Weed Chain catalog.

### A Lot of Cotton

The crop from 1,890,000 acres will be required to fill the orders for cotton being placed by the automotive industry for 1941, according to a compilation of statistics released by the Cotton-Textile Institute. A total of 945,000 bales of cotton, about 460,000,000 pounds, will be used with individual models consuming between 51.4 and 80.9 pounds of raw cotton, depending on details of design and manufacture.

Upholstery, cord and fabric for tires, top materials, artificial leather, plastics, lacquers and mechanical rubber goods such as radiator, heater and brake hoses are the principal items which contain cotton or use cotton in their manufacture. Additional minor uses include gaskets and washers, silent timing gears and insulation.

Sets the Pace  
FOR QUALITY  
and ECONOMY



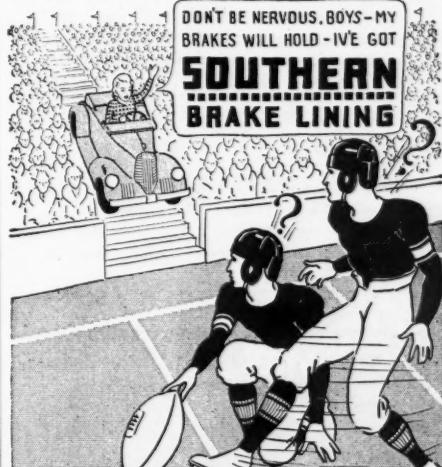
The quick-acting flux of Gardiner Acid-Core Solder permits exceptionally fast, clean work. Unusually high tensile strength insures lasting bonds. Yet, thanks to modern methods exclusive with Gardiner, these better solders are low in first cost and most economical to use. Other Gardiner products famous throughout the automotive industry for top performance and bottom cost are Solid Wire, Bar and Body Solders . . . and Permanent Lining Babbitt metal.

Complete Display at  
A. S. I. Show in  
Chicago—Space B-96



4839 S. Campbell Ave., Chicago, Ill.

### CHARLOTTE SOUTHERN SAYS



SOUTHERN  
FRICTION MATERIALS CO. - CHARLOTTE, N.C.



# FREE!

# Money-Makers for You

Here they are! **FREE OFFERS** to **YOU**, from **LEADING MANUFACTURERS**. Money-makers! That's what they are! "Boiled down" on this page and the next, so you can get **ALL OF THEM YOU WANT**. Just **CHECK THE NUMBERS** that interest you, on the back of post card below. **MAIL THE CARD** to **Motor Age** TODAY. We do the rest! No obligation to you. Just an easy chance to **MAKE MORE MONEY**!

**This FREE SERVICE** is for anyone doing automotive work.  
Requests from outsiders cannot be handled.

## MAIL THE POST CARD NOW for these Money-Making FREE Offers!

The numbers of these paragraphs agree with the page number on which the manufacturer's advertisement appears.

**IFC** When motorists vote HASTINGS STEEL-VENT PISTON RINGS as first in the replacement field . . . why not SELL them the way they want? It's on Inside Front Cover. For further information write or check card.

**IBC** Take a tip from the thousands of users of BLACKHAWK HYDRAULIC JACKS and investigate this top-service line today. Shown on Inside Back Cover. Write direct for information or check postcard.

**1** When the thermometer drops and the customers start pouring in for anti-freeze are you prepared to accurately check their radiators? You are with an EDELMANN TESTER shown on page 1. Write for details or check postcard.

**2** HEIN-WERNER introduces the new "HEINITE" PUMP PISTON used in their HYDRAULIC JACKS. With this new feature HEIN-WERNER offers increased life and service. See page 2. Write or check postcard.

**3** In the spotlight since 1909 with more than 50 automotive quality products . . . PERMATEX. The picture on page 3 tells its own story. For complete details write direct or check postcard.

**4** Check into the new BUICK DEALER'S FRANCHISE and open the door to the easiest profits you've ever made. Don't fail to read about BUICK on page 4. Write or check postcard for information.

**5** Don't forget CHAMPION SPARK PLUG'S XMAS GIFT SET. Shown on page 5, it's a smash hit with dealers and customers alike. For complete details write or check postcard.

**6** When you're selling the PUROLATOR LINE you're receiving the benefits of COLLIER'S P.S. Campaign. Check on this today, and read page 6. For further information write or check postcard.

**7** THERMOID BRAKE LINING answers the motorists' problem from Big Town to Boros Corners. Have you discovered the profit in this line? Don't miss page 7. Write or check postcard for detail.

**8** Cash in on this important message to a BILLION DOLLARS' worth of cars . . . NOW! COLLIER'S "P.S." CAMPAIGN does all the work . . . you reap the reward. It's on pages 8 and 9. Write for information or check postcard.

**10** Your customers need a long-lived TIRE CHAIN. Answer their need by selling them . . . CAMPBELL LUG-REINFORCED CHAINS. They're shown on page 10. Write direct for details or check postcard.

**11** Before the snow flies is the time to check up on TEXACO'S WINTER LUBRICANTS. Then you're set and ready for the rush. See page 11 for details. Write direct or check postcard.

**12** Recommend and sell the spark plug used and approved by the champions . . . BOWES SEAL FAST PLUGS. Don't miss the interesting story on racing on pages 12 and 13. Write for details or check postcard.

**14A** K-D LAMP CO. introduces three newcomers to its extensive line . . . K-D CLEARANCE and MARKED LIGHTS. See them on page 14. For complete information write direct or check postcard.

**14B** SINKO'S exclusive new steering post SHIFT LEVER KNOB is a profit leader for any shop. Have you stocked your supply yet? Don't miss page 14. Write for details or check postcard.

**15** ARO EQUIPMENT CO. tells an interesting story on page 15. Read it and discover why ARO EQUIPMENT rates so highly with service men. For complete details write direct or check postcard.

**16** Three great lines . . . three advertising campaigns . . . THREE PROFIT OPPORTUNITIES! That's what you find when you sell DODGE, PLYMOUTH and DODGE JOB-RATED TRUCKS. See page 16. Write for details or check postcard.

**59** When those worn pistons are replaced with "LYNITE" T-SLOT LO-EX PISTONS you've a new card under you. Profit by the story on page 59. For further details write ALUMINUM CO. OF AMERICA or check postcard.

**60** Cut down on those oversized electric bills with a new KELLOGG AIR COMPRESSOR. You'll be money ahead when you've installed one. See page 60. Write or check postcard for details.

**61** STUDEBAKER scores again with the lowest-priced sedans in America! Why not investigate the STUDEBAKER FRANCHISE right NOW? See page 61 for details. Write direct or check postcard.

**63** The right ring for the right groove of the right piston . . . that's what you get with a line of McQUAY-NORRIS ALGINIZED ENGINEERED SET PISTON RINGS. Page 63. For details write or check postcard.

**65** Pick up that extra business you're missing with AC SPARK PLUGS and operate as an AC CLEANING STATION. See page 65 for profitable information. For further details write or check postcard.

**66** You'll be able to handle more shopwork in less time with the KELLOGG PORTABLE ONE-END LIFT. Don't miss the story on page 66. Write for further information or check postcard.

**67** Help your customers keep upkeep down with WOLF'S HEAD WINTER OILS and LUBES. Investigate the WOLF'S HEAD GUARANTEED. See page 67 for details. Write direct or check postcard.

**68** Sell your customers the HADEES CAR HEATER and listen to the pleased comments . . . and to the tinkle of the cash register. See page 68 for details. Write for further information or check postcard.

**69** Don't miss L. E. SCHIRBER'S story on SOCONY-VACUUM'S CAR DEALER SERVICE PLAN and what it's done for him. It's on page 69. Write for full information or check postcard.

**70** Stock and sell the GASKET approved by many leading car manufacturers . . . FEL-PRO GASKETS. Check on the profitable FEL-PRO LINE today. See page 70 for details. Write direct or check postcard.

**71** Stock and SELL AC SPEEDOMETER CABLES and KITS . . . the line assuring quality in materials, workmanship and performance. Don't miss page 71. Write direct or check postcard for information.

**72** Create new profit-service jobs, cut repair time, increase used car values with HYDROJET JENNY. It's shown on page 72. Write HOMESTEAD VALVE MFG. CO. or check postcard for further details.

**73** Try a U. S. "TAILOR MADE" LIFT in your shop and discover the new safety and convenience of this equipment. More work done in less time with less risk. See page 73. Write or check postcard.

**74** If you do CLUTCH service you'd better investigate the MONMOUTH CLUTCH PLATE. Hundreds of dealers are profiting by its use. See page 74. For details see your NAPA jobber or check postcard.

(Continued on other side)

## Clip This Card

Check the FREE  
OFFERS You  
Want

(They are on the reverse side)

Complete Details  
Will Be Sent  
To You

FIRST CLASS  
PERMIT No. 18  
Sec. 510, P. L. & R.  
Philadelphia, Pa.

**BUSINESS REPLY CARD**  
NO POSTAGE STAMP NECESSARY IF MAILED IN THE UNITED STATES

POSTAGE WILL BE PAID BY

**MOTOR AGE**

Chestnut and 56th Sts.

Philadelphia, Pa.

# More FREE Money-Makers for YOU

**75** Read the letter from M. J. COOPER concerning FORD STEEL SECTION PISTON RINGS on page 75. He discovered profit in this line and so can you. Write for information or check postcard.

**76** YOU can maintain YOUR sales leadership by selling VALVOLINE OIL, "X-18" ALL-PURPOSE LUBRICANT and other VALVOLINE products. Read page 76 for details. Write or check postcard.

**77** All your air problems are solved when you install a WAYNE AIR COMPRESSOR, backed by WAYNE'S Nation-Wide Service. Don't miss page 77. Write or check postcard for further details.

**78** ACHEFON suggests "dag" COLLOIDAL GRAPHITE as a perfect RUBBER LUBRICANT for those squeaky shackles or engine mountings. See page 78 for details. Write or check postcard for further information.

**79** Why play along with a losing ring combination? Get into the profit-scoring column with SIMPLEX "LL" PISTON RINGS. Don't miss page 79. Write direct for details or check postcard.

**80** For smooth performance . . . replace with BOWER . . . the "Micro-Honed" TAPERED ROLLER BEARING and watch your satisfied customers multiply. It's on page 80. Write for details or check postcard.

**81** When you're checking on AHLBERG'S BOWER BEARINGS don't fail to inspect the AHLBERG FRONT WHEEL BEARING UNIT. Profit hint on page 81. Write direct for details or check postcard.

**82** Give your customer the RING SET that ends drags and excessive oil pumping . . . WEL-EVER'S DRAN-BAC "H" SETS" shown on page 82. For information write or check postcard.

**84** Give your customers the safer, more efficient transportation they require from their cars with BEAR WHEEL ALIGNMENT SERVICE described on page 84. For details write or check postcard.

**85** When you sell or install a set of RICH SILCHROME-X STEEL VALVES you can be confident your customer is satisfied. Don't fail to read page 85 for profitable details. Write or check postcard.

**86** PICK, the quality line of OIL FILTERS, low in cost, efficient in operation will make new friends and new PROFITS for you in 1941. See page 86. Write us for details or check postcard.

**87** Have you checked on the remarkable advantages of the DE SOTO DEALER'S FRANCHISE? Read about the sensational values of the new line on page 87. Write for information or check postcard.

**88** Sell the parts approved by the NAPA . . . ALLIED MOTOR PARTS. There's a definite assurance of quality on each item. Don't miss page 88. Write direct for further details or check postcard.

**89** Give your customers the security they're seeking with LIBBEY-OWENS-FORD SAFETY GLASS. They know the name and appreciate the quality. See page 89. Write for details or check postcard.

**90** Get on the bandwagon with BURD GRAF-FLOX PISTON RINGS and prepare for the landslide of satisfied customers. The story's on page 90. Write direct for information or check postcard.

**(Continued from other side of page)**

**91** For those particular customers who are hard to satisfy . . . recommend QUAKER STATE'S NEW STABILIZED MOTOR OIL It's top. See page 91. For details write direct or check postcard.

**92** You NEED the K-D LINE if you handle valve work in your shop. Investigate this assortment of time-saving tools today. See page 92 for details. Write direct or check postcard.

**93** Motorists AND customers don't have nine lives! So, recommend RAYBESTOS BRAKE LINING and give them the safe driving they require. It's shown on page 93. Write or check postcard for details.

**94** COLE-HERSEE shows you the products used by automotive manufacturers in the 1941 lines. It's a BIG market and a PROFITABLE one to shoot for. See page 94. Write or check postcard for details.

**95** They're going like hotcakes! What? Why, the new OLDSMOBILE, of course. Don't fail to read about the sensational new models on page 95. Write direct for details or check postcard.

**96** Don't miss the one of many letters received by MODERN EQUIPMENT CORP. on the excellence of its PAR AIR COMPRESSOR. Have you investigated this service item's possibilities on page 96. Write for details or check postcard.

**99** The season is coming when cooling systems will need tuning-up with WONDER SOLV and quick, safe repairs can be made with WONDERWELD. See page 99. For details write MILLER MFG. CO. or check postcard.

**100** Here's the BEARING REPLACEMENT you servicemen have always needed . . . LINK-BELT SHAFER ROLLER BEARING for Front Wheels, Rear Axles, Differentials. See page 100. Write or check postcard for details.

**101** Get on the bandwagon of PROFIT with HUDSON . . . America's popular low-priced car. See it today . . . check on the HUDSON FRANCHISE, and profit by reading page 101. Write or check postcard for details.

**102** When customers ask for a COIL that will deliver you can safely recommend the new P & D SUPER POWER AIR COOLED COIL. It's shown on page 102. Write for information or check postcard.

**103** Why take chances selling or installing brake lining of unknown quality? Play safe and build a reputation with JOHNS-MANVILLE BRAKE LINING. See page 103. Write for details or check card.

**104** Your service shop will operate at new speed, new economy with a VAN DORN ELECTRIC SANDER. It's shown on page 104. For further information write direct or check postcard.

**105** C. E. NIEHOFF & CO. offer you an ATTRACTIVE DISPLAY STAND FREE with each order of NIEHOFF QUALITY IGNITION PARTS. Don't miss this on page 105. Write for details or check postcard.

**106** For top performance in bad weather . . . recommend the WEED BAR-REINFORCED TIRE CHAIN. Your customer will pass the word along. They're shown on page 106. Write or check postcard for information.

**107** Service more cars quickly and profitably with SHURHIT IGNITION ASSEMBLIES. Clip the coupon on page 107 or check postcard for complete information.

**111** CRESCENT CO. through its WIRY JOE PRICE, PROFITS, QUALITY, VOLUME. Don't fail to read page 111 for profitable news. Write for further details or check postcard.

**112A** There's big money in car-body work when it's done right . . . with KESTER BODY SOLDERS. You can make quality repairs in no time at all. Read page 112 for details. Write or check postcard.

**112B** SCHRADER . . . the name doesn't have to be explained. Known for years as top manufacturers of TIRE VALVE CAPS and CORES they offer a REPLACEMENT PACKAGE that earns by its appearance. See page 112. Write for complete details or check postcard.

**113** The U. S. ELECTRICAL TOOL CO. is offering you the same quality and efficiency that the government gets in its tool line. It's on page 113. Write direct for details or check postcard.

**114A** AMERICAN GREASE STICK CO. recommends DOOR-EASE DRIPLESS OIL and DOOR-EASE STAINLESS GREASE STICK for clean, profit-building service. Don't fail to read page 114. Write for details or check card.

**114B** G.A.C. MFG. CO. offers for your approval . . . and profit . . . the UNIVERSAL FENDER SPREADER. Don't miss it on page 114. For complete details on this indispensable service item write or check card.

**114C** Are you missing a bet? Those extra profits from wheel-balancing would come in mighty handy. Don't miss the HARLEY C. LONEY CO.'s story on L & H WHEEL BALANCING WEIGHTS on page 114. Write direct or check postcard.

**114D** For a concentrated DEGREASER that gives concentrated RESULTS . . . try GUNK manufactured by CURRAN CO. Don't miss it on page 114. Write direct or check postcard.

**115A** ERIE MFG. CO. offers a smart new line of custom-built GRILLE GUARDS. Dress up your customers' cars at small cost to them and large profits to you. See page 115. Write or check postcard.

**115B** For greater safety in adverse weather your customers will appreciate you recommendation of U-AD-CO'S FOG LIGHTS shown on page 115. For details write direct or check postcard.

**115C** Play safe in floor-cleaning . . . use OAKITE PENETRANT, the safe, efficient cleanser. Don't miss the FREE BOOKLET offered on page 115. For information write direct or check postcard.

**115D** RAILWAY EXPRESS offers you a quick, convenient service that eliminates the old problem of waiting for parts to arrive. Read page 115 for details. Write direct or check postcard.

**116A** Increase the number of car washes, cut time costs, wash cleaner . . . with MAGNUS NXL CLEANER. Don't miss page 116 for profitable hints on this product. For details write or check postcard.

**116B** You can offer your customers appearance, safety AND economy with SKINNER RETREAD TIRES. Don't miss the profit opportunity on page 116. Write or check postcard for details.

**Check ALL the  
FREE OFFERS  
You Want**

**Mail The Card**

**NOW**

**IMPORTANT!  
FILL IN ALL THIS  
INFORMATION**

**We cannot extend  
this FREE Service  
unless you do.**

**MOTOR AGE, Philadelphia, Pa.**

**1140**

Please send me, without obligation, complete information on FREE Money-Making OFFERS checked in squares below

IFC	10	63	74	85	95	107	115B	118D	119E	121
IBC	11	65	75	86	96	111	115C	118E	119F	122
1	12	66	76	87	99	112A	115D	118F	119G	
2	14A	67	77	88	100	112B	116A	118G	120A	
3	14B	68	78	89	101	113	116B	118H	120B	
4	15	69	79	90	102	114A	116C	118I	120C	
5	16	70	80	91	103	114B	117	119A	120D	
6	59	71	81	92	104	114C	118A	119B	120E	
7	60	72	82	93	105	114D	118B	119C	120F	
8	61	73	84	94	106	115A	118C	119D	120G	

Name . . . . .

Your Company's Name . . . . .

Street & No. . . . .

My Jobber's Name and Address Are . . . . .

Free Books Listed on page 96—A  B  C  D

# An Edelmann Tester For Every PURPOSE and PURSE

If you are interested in the finest anti-freeze tester that money can buy—we have it. If your budget is limited—we have an instrument to fit your pocketbook. But whatever tester you choose you can be certain of one thing—accuracy and durability are guaranteed to be unexcelled. In addition to the instruments illustrated on this page Edelmann features a complete line of individual testers that are made to test one solution only, such as Zerex, Zerone, "Prestone" brand ethylene glycol, Alcohol, Methanol or Trek Anti-Freeze. Regardless of whether you want to test 101 different solutions with one instrument or specialize in a single brand of anti-freeze we have a tester at the price you want to pay.

*Self Calculating*

## FREEZ-D-TECTOR

with the Roll-A-Way Capacity Korrektor

List Price \$10.00 Dealer's Price \$4.95

**Special** Introductory Offer  
ONLY \$3.95

(with your old Thermo\* Freeze Tester)

You can save one dollar by purchasing this freeze tester now!

To introduce this new freeze tester sensation we offer this \$10.00 list instrument for only \$3.95 on an exchange basis. If you have an old, worn out tester on hand now is the time to trade it in and get the most for your money. For precision—it's tops. For simplicity—it has no equal.

IT'S THE SENSATION OF 1940

\*MUST HAVE BULB, TIP, ONE GOOD JAR, FLOAT AND THERMOMETER

No.  
25

No.  
46

No.  
116

## ILLUMINATED ZERO TESTERS

A masterpiece of hydrometer engineering. Combined in this single instrument is the ability to test 101 different solutions. Two separate jars test solutions lighter and heavier than water with utmost accuracy. A splendid instrument for testing everything quickly and easily—priced within the means of all service operators.

Made to test today's most popular nationally advertised anti-freezes. "Prestone" brand ethylene glycol, Zerone, Zerex and Alcohol. Newly designed float and scale affords maximum readability. Quality, accuracy, and all around serviceability make this instrument the choice of servicemen everywhere.

Tests such popular solutions as Alcohol, "Prestone" brand ethylene glycol, Zerone and Zerex. Illuminates for nite testing. Made of heavy, heat treated glass, reinforced top and bottom; highest quality heavy red rubber parts with control capacity bulb. Completely self-contained, no parts or charts to become lost.

TO DEALERS  
Only \$3.30

TO DEALERS  
Only \$2.98

TO DEALERS  
Only \$2.98

*E. Edelmann & Co.*

CHICAGO, U. S. A.

MAKERS OF PRECISION INSTRUMENTS SINCE 1901

Only HEIN-WERNER  
HYDRAULIC SERVICE JACKS  
are equipped with a HEINITE pump piston  
Guaranteed for three thousand full capacity lifts  
This is equivalent to two years of service at five lifts per day  
Will wear ten times as long as pistons previously used

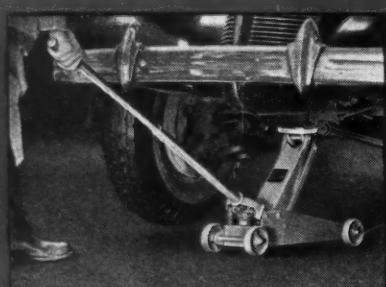
Built Right  
and  
Priced Right

Model "O"  
\$17 45  
net to dealer

Has Easy-to-Spot →  
GLISTENING WHITE SADDLE



MODEL "O"



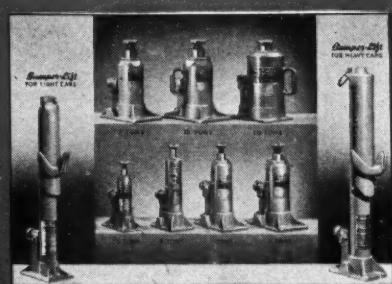
A few strokes of handle quickly and easily raise the heaviest of passenger cars high enough to change a tire. Photo shows jack raising 4,460 lb. Buick.

MODEL "O" O'BOY, illustrated, is an exceptional value at only \$17.45 net to dealer (West Coast \$18.45). It has structural steel side members, easy-to-spot white saddle, quick removable handle, leak-proof hydraulic unit... Capacity 2,500 lbs.

MODEL "O" O'BOY has all the features of Model "O" and also has swivel wheels and swivel saddle. Dealer price \$19.95 (West Coast \$20.95)...Order through your jobber or write us.

HEIN-WERNER MOTOR PARTS CORP.  
Waukesha, Wisconsin

**HEIN-WERNER**  
*hydraulic* JACKS



Complete H-W line of Hydraulic jacks includes: 1½ ton, 2, 3, 5, 8, 12 and 20 ton capacity Hand Jacks for cars and trucks... Also 1½, 2, 3 and 4 ton Service Jacks.

# In the Spotlight... SINCE

SINCE  
1909



PERMATEX COMPANY, INC., Sheepshead Bay, N.Y., U.S.A.

MOTOR AGE, November, 1940

*When writing to advertisers please mention Motor Age*

**MOTOR AGE, November, 1940** When writing to advertisers please mention **MOTOR AGE**

**MOTOR AGE**, Vol. LIX, No. 12, Published monthly by Chilton Co., Chestnut & 56th Sts., Phila. Entered as Second-Class Matter December 27, 1935, at the Post Office at Philadelphia, Pa.; Under the Act of Congress of March 3, 1879. In case of Non-Delivery Return Postage Guaranteed. Subscription price: United States, Mexico, United States Possessions, and all Latin-American countries, \$2.00 per year. Canadian and foreign, \$3.00 per year; single copies, 25 cents.

# What's hotter than a FIREBALL?



*Answer: Certainly nothing  
on the 1941 automotive horizon*

THERE'S a lot of high-powered language in the automobile ads these days.

So we're going to talk about the new 1941 Buick and its sales possibilities in low-pressure terms and let intelligent men make intelligent judgment from the straight facts of the case.

This new Buick is new in some 75 items from the Buick-developed "mass-stream" styling to the Buick FIREBALL straight-eight engine under its bonnet.

There are 22 models in five series in the line and engines in three power ranges — 115, 125 and 165

**BUICK PRICES BEGIN AT  
\$935**

for the Business Coupe

★ delivered at Flint, Mich. State tax, optional equipment and accessories — extra. Prices subject to change without notice.

horsepower — and the Big Bruiser in our three top series is the highest-powered standard-production engine we know of.

There is five-foot front seatroom in all models. There are new frames, new concealed running boards, new steering, new roominess, new finishes, new comforts galore.

There is a totally new carburetion system that not only steps up power but increases economy by as much as 10% to 15%.

More than that, you'll find that this bundle of concentrated sales appeal is backed up by a franchise that's just about as sweet a proposition as you could write for yourself.

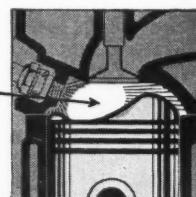
*Buick SPECIAL Sedan  
\$1052. White sidewall tires extra.★*

If you want to know how sweet, just do a little looking around and a little asking of questions among Buick dealers you know. There are still a few spots open where you might get in on the "happy days" they've been enjoying. To learn more about them, just drop a line to:

William F. Huftstader  
General Sales Manager  
Buick Motor Division, Flint, Mich.

## THE FIREBALL DOES IT!

Modern gasolines have high octane ratings to permit higher compressions without "ping." Note how this piston, which can be used only in valve-in-head engines, rolls the fuel charge into the shape of a flattened ball that centers around the new, smaller, racing-car type spark plug. Fired at its very heart, this more highly compressed fuel lets go with such full-forced, "ping-free" wallop that any gasoline of 75 octane rating (now available at standard-fuel prices) may be used in the 115-hp. engine. Any fuel of 80 octane rating serves in the 125- and 165-hp. engines.



# "Best Buick Yet"

EXEMPLAR OF GENERAL MOTORS VALUE

# LET CHAMPION HELP YOU MAKE XTRA XMAS PROFITS

ONCE AGAIN Champion presents the Christmas package gift set which will help materially to increase your sales and profits at Christmas time. This Champion Gift Set was such a sensational seller last year—such a smash hit with customers—that many welcome additional dollars should drop in your till.

The special Champion Christmas assortment contains 30 Champion Spark Plugs—at regular prices—attractively packaged in Christmas cartons, each containing a complete set, that will enable you to service practically all passenger cars. They are packed in a special container together with a special display poster, cards, and envelope inserts. Courtesy installation

cards are also included. The motoring public will be told about these Champion Gift Sets in a tremendous campaign in national magazines, farm publications, as well as newspapers.

Here is your opportunity to make extra profits at a time when you usually have very little to offer your customers in the way of useful merchandise. Order your stock of Champion Gift Sets now and be ready when the customer comes in to buy. Only active numbers are presented and they are always salable.

Don't slip up on this great chance to make this Yuletide a high tide of Christmas profits.



*Champion  
Christmas Assortment  
Contains 30 Spark Plugs . . .*

will service 90% of all passenger cars — packed in four different assortments to meet all requirements.

This Champion Christmas ad will appear early in December in the Saturday Evening Post, Collier's, Life, Look, Time, Country Gentleman, Capper's Farmer, Successful Farming, Farm Journal, Pacific Rural Press, Progressive Farmer and Southern Planter. In addition to these national magazines, a similar advertisement, 600 lines in size, will appear December 15th in rotogravure in every newspaper in the country having a rotogravure section. Nearly 34,000,000 circulation.



# A GOOD POINTER

FROM THE  
PUROLATOR ADVERTISEMENT  
IN NOVEMBER 2nd

## Collier's

"...check your filter  
when you change  
to winter oil"

No motor oil can do a good job if it's contaminated with dirt, dust, carbon, sludge and other harmful abrasives. Good lubrication at any season requires *clean* oil—clean when it goes in, and kept clean while it's working. Check your customers' filters when they change to winter oil. Replace, when needed, with genuine Purolator cartridges or elements!

Three profitable ways to

**KEEP IT CLEAN**  
with **PUROLATOR**

### PUROLATOR Replacement Elements

In line with Purolator's consistent policy of leadership, Purolator elements today have greater dirt capacity than ever before. There's a genuine Purolator replacement element made to fit every popular automotive filter. Most sizes list at \$1.00.

**\$1.00**

PUROLATOR PRODUCTS, INC., formerly Motor Improvements, Inc., NEWARK, NEW JERSEY

### PUROLATOR

Kits for Ford 85, Chevrolet, Mercury  
Contain replacement-element type  
Purolator with all necessary fittings. For Ford 85 beginning with  
1935 models, Chevrolet beginning with 1937 models, all Mercury  
models. Every installation  
means a new customer for your  
Purolator elements! List Price for  
complete kit, only \$5.00.

**\$5.00**

### PUROLATOR

Type NE-1517 for Chrysler-built Cars  
Fits all Chrysler-built cars factory-  
equipped with EA $\frac{1}{2}$  or vertically-  
mounted E $\frac{1}{2}$  Purolator. Simply  
remove the equipment filter and  
install the NE-1517, using orig-  
inal fittings and tubing plus one  
extra bracket. List Price, \$3.50.  
(Slightly higher on West Coast.)

**\$3.50**



# From Big Town to Boros Corners

## Thermoid gives you PRECISION PROCESSING

Precision Processing of renewed brake shoes, lined with Thermoid Brake Lining, is the answer to better brakes... and better brake service business. For the first time in a decade there's something new in brake re-lining... something that every prospect can instantly appreciate.

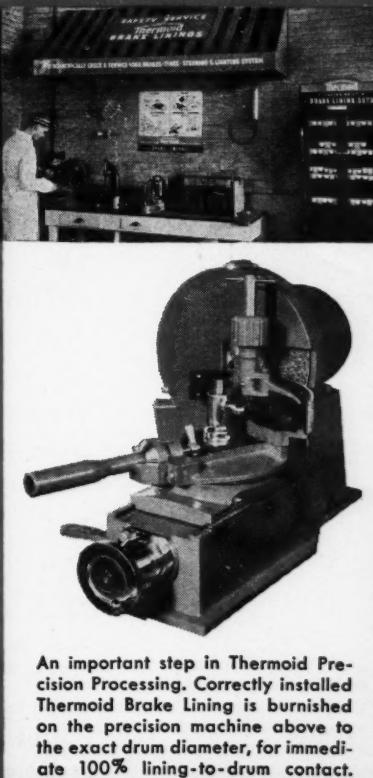
Precision Processing guarantees 100% lining-to-drum contact. It takes less time

to adjust brakes fitted with burnished brake shoes. Your customer is assured positive, equalized braking from the very first brake application.

For easier selling... for better, faster service... and for complete customer satisfaction... be sure that your Safety Service Department features Thermoid Precision Processed Brake Service.

### THERMOID BRAKE SHOE EXCHANGE SERVICE

If you are located in Big Town, here's the last word in simplified brake service. Just take off the old shoes... exchange them at your Thermoid Jobber's for completely renewed, Precision Processed shoes. They're checked, cleaned, painted, re-lined with certified-correct Thermoid Brake Lining and precision burnished for complete lining-to-drum contact.



An important step in Thermoid Precision Processing. Correctly installed Thermoid Brake Lining is burnished on the precision machine above to the exact drum diameter, for immediate 100% lining-to-drum contact.



**THERMOID CO.  
TRENTON, N. J.**

# Thermoid

## Custom-Built

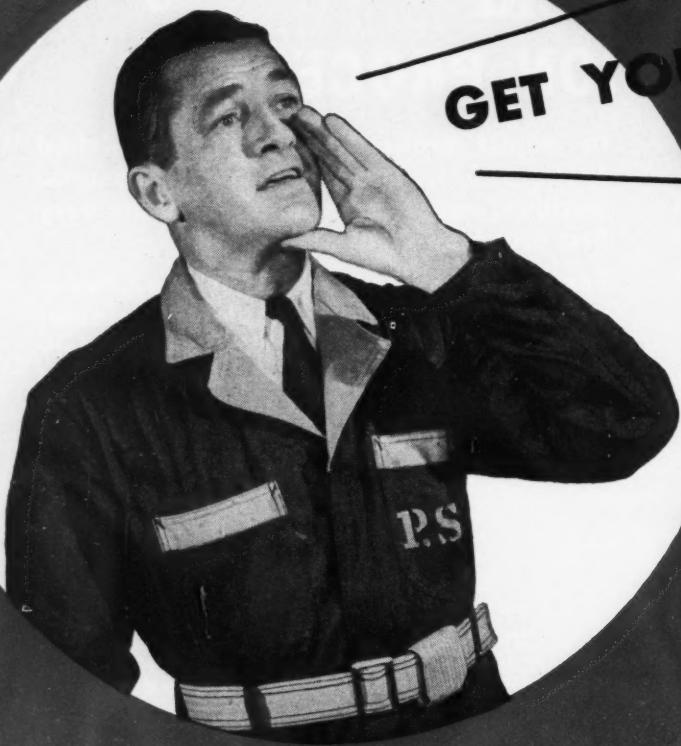
BRAKE LINING SETS



JUST WRITE THIS ON A POST CARD and MAIL IT

"I want to cash in on P.S.-Tell me how!"

GET YOURSELF READY FOR  
WINTER SALES



Nearly 3 million families are reading the two page P.S. Spread you see illustrated here . . . AND THEY'RE READING IT RIGHT NOW! It's in the November 2nd issue of Collier's.

The next four to six weeks are going to be the peak period for volume sales in winter accessories and services. Cash in on it by tying in with Collier's P.S. reprints . . . folders . . . badges.

Don't let war news or political forecasting make you forget that old man winter never lost an election nor a battle with the unprepared motorist. There's still time to boost your sales with P.S. But you've got to hurry. Tie in and you'll cash in!

**IT'S A HIT!** This brand new booklet—20 pages of "P. S. Questions and Answers" right from the P. S. Spreads. It's a buyers' guide to safer, pleasanter motoring. See page opposite for description and prices.

Collier's P.S.  
L.O.D.

# CASH IN ON THIS IMPORTANT MESSAGE TO A BILLION DOLLARS WORTH OF MOTOR CARS

This Collier's P. S. Spread is in there working right now! . . . and right among the cream of the automobile crop in your own community, car owners are learning to jump the gun on

winter driving troubles. They don't wait for a freeze-up. Why should you? We're ready with a crew of hustlers to help you get yourself ready for winter sales . . . In time!

Collier's For November 2nd

How to Get Your Car Ready



Some so-called "unaccountable" accidents are really due to—what? \$ The average house lighting current is 110 volts. What is the voltage of your car current—6 volts, 10,000 volts, or both? \$ Are winter lubricants important? \$ On which filter should the element be replaced and on which should it be cleaned? \$ Is tire wear greater in summer or in winter?

WHEN you step on the steps of your world and buck out of the garage, you're in the world with you. They're with you, safe and sound, and you can't help but feel that you have done a good job.

It's a good job, too, perfect, of course, but the possibility of trouble to the vanishing point is there. New things you must see in yourself. By knowing you have money and increase your car's value.

To give you this information, Collier's has a special service—Collier's P. S. Service, appearing regularly at those service stations and garages. This P. S. minimums data with you ready to perform with maximum efficiency during the winter.

Just to make sure you don't miss anything, consider your car as divided into four departments—the cooling system, the power frame, the electrical system, the

in the radiator are uncovered, there are three ways to do this. When placed in the radiator, set out the little holes and the water will be forced to pass through the radiator.

**Radiator Hose.** The radiator and the engine block are connected by radiator hose. This causes vibration and rattling. Being constantly exposed to the heat of the water, these hose connections eventually become brittle. Check to see that they are in good condition. If they are not, it is wise to replace them. They are not expensive.

**Fan Belt.** The transmission belt did not depend on the air intake in any way through the radiator. They placed it in back of the radiator to keep the fan from getting hot. If the fan isn't running, the car overheats, particularly in the cold weather.

## Order Now Minimum Order \$3.00

Get your Preventive Service Material in time for the big season. Write today to Preventive Service, Collier's, 250 Park Avenue, New York City. Here are the tie-in pieces available.

**G2. PLAIN PROOFS.** Full size reproduction of the Collier's P. S. Spread. Ideal to go with your Fall mailing to your Number One List. Only \$1.00 per hundred. (Minimum order 200.)

**G3. FOUR-PAGE FOLDER.** A self-mailer that goes for 1 1/2c. Includes a form letter to the car owner on Page One. The Collier's P. S. Spread appears on Pages 2 and 3. Page 4 for addressing. \$1.50 per hundred. (Minimum order 200.)

**G4. QUESTION AND ANSWER BOOKLET.** A moderate sized booklet called HOW'S

YOUR CAR-Q? containing 67 questions and their answers from various P. S. Spreads which have appeared to date. Offer them to car owners as a handy guide to be kept in the dash compartment. Booklet stresses Preventive Service. Permanent good will builder . . . \$8.00 per hundred, or 10c each.

**G10. BADGES FOR ATTENDANTS.** Size 2 1/8 inches. Brilliant red and black. All they say is "P. S. for Personal Safety"—and they stimulate plenty of discussion and lots of business. Price 5c each. (Minimum order, 3 badges.)



# Winter

Today, auxiliary Solder Beam Lamps are available for older cars.

## Running Gear

This can be termed the "deportment" of the car. It has to do with practice, sweep and traction to avoid skidding.

## Tires

Tires should be inspected for their condition and that means tread. Winter tires are not in general use, but the proper tread and tire pressure are important.

## Electrical System

In your automobile, the electrical system is much more comprehensive than the lighting system. In the home, the electric company supplies current to the house, but in the car, the engine does the job. The electric current is supplied to the motor, the radio, the heater, the defroster, the lights, the horn, the wipers, the heater and defroster are in good condition to operate effectively.

See the radio, heater and defroster or in good working order. So frequently the radio and heater are in good condition, but you should still see the service station.

Windshield wipers are about to enter the winter season. Be sure the blades are in good condition. The proper adjustment to clean the glass without scratching is in good condition to operate effectively.

See the radio, heater and defroster or in good working order. So frequently the radio and heater are in good condition, but you should still see the service station.

## Protection for the Car

The best and final of your car should come for its winter protection.

Winter weather is hard on the finish of your car. The paint is liable to be damaged.

Painting is a beautiful finish of your automobile to be sure.

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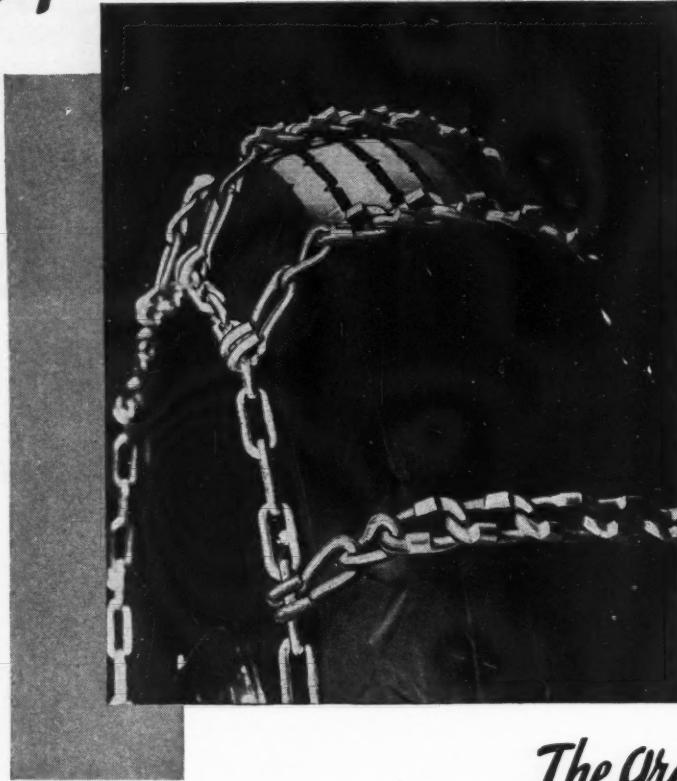
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*They SELL because they're BETTER*

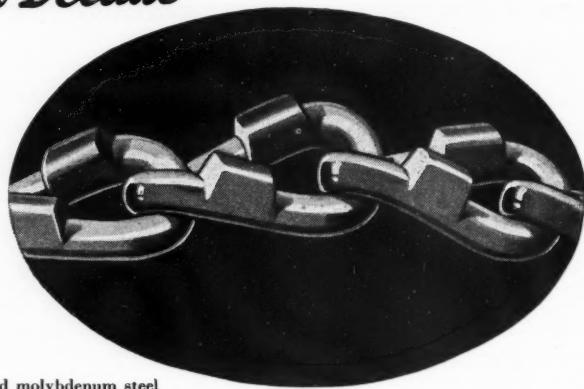


## CAMPBELL *Lug-Reinforced* Tire Chains

With many good products, quality is difficult to point out, but with Campbell Lug-Reinforced Tire Chains, the superiority is instantly apparent. Their unique construction tells at a glance that here at last is a scientific answer to the problem of all-way traction.

That's why Campbell Lug-Reinforced Tire Chains are so easy to sell. They are the kind of chains that motorists have wanted. They not only give real protection under slippery winter conditions, but they give mileage that makes them really economical.

### *The Greatest Advance in Tire Chains in a Decade*



Let's be honest about the tire chain business. Ordinary chains didn't give the performance or service that motorists demanded. As a result, some "took a chance" in preference to having the same old experience over and over. Someone had to bring out a really superior tire chain to overcome the condition. Campbell Lug-Reinforced Tire Chains have proved themselves to fill that need. If you really want to get back to profits on tire chain sales, you'll handle "Campbells." If your jobber can't supply you, write direct.

*check these features*

#### ONE-PIECE CONSTRUCTION

Made of the finest case-hardened molybdenum steel . . . completely in ONE PIECE. There are no welded bars to break off. You not only get longer life, but full protection for the full life of the chain.

#### POSITIVE ALL-WAY TRACTION

The exclusive, patented saw-tooth design guarantees a new high in traction under the severest circumstances of ice, snow or other slippery conditions. Look at the illustration and see why no other chain offers such positive traction.

#### LONG LIFE

Long life is far from an empty phrase with Campbell Lug-Reinforced Tire Chains. The use of the finest case-hardened alloy steel, positive traction to prevent undue slippage, and one-piece construction combine to assure mileage that formerly couldn't be hoped for.

#### FULL PROFITS

Your profits on Campbell Lug-Reinforced Tire Chains are fully protected because these chains are sold only through respected, carefully selected channels of distribution.

INTERNATIONAL CHAIN & MFG. CO.

YORK

PENNA.

*More profits before the snow flies*

**CHANGE**  
TO WINTER LUBRICANTS NOW!

DON'T WAIT. There's cold weather ahead—change to winter-grade Insulated Havoline or Texaco Motor Oil and get quick starting and the instantaneous lubrication insulated oil can give in cold weather. Change to Texaco winter-grade gear oils for easy shifting. Change to Marfak chassis lubricants for easy riding and put in an anti-freeze to avoid freeze-up troubles. Only this service gives your car complete protection. Get it today at your Texaco Dealer.

TEXACO DEALERS

TEXACO

TIME IN FRED ALLEN—  
Texaco Dealers invite you to enter Fred Allen's full-hour program of the TEXACO STAR THEATRE . . . with Texaco Baker, Al Goodman's Orchestra and a guest. Every Wednesday Night, Columbia Network, 9:00 E.S.T., 8:00 C.S.T., 10:00 M.S.T., 9:00 P.S.T.

HERE'S another ad in the great Fall Drain campaign now appearing in color in leading national magazines ... to bring a bigger share of Fall Drain business to Texaco Dealers.

*Now Texaco Dealers are cashing in on cold weather changes*

NOW IS THE TIME for motorists to change to winter lubricants.

And here is the third of the four striking color pages that tell motorists why they should get this done at Texaco Dealers.

Motorists will also see the compelling, attention-getting station displays that are part of this program.

They receive the special mailing pieces

that are furnished to Texaco Dealers.

The result—more business and extra profits that will come in mighty handy during the winter months.

Look into the extras in profit building that come with the Texaco Franchise.

Ask your Texaco salesman for the whole big story or write to us direct.

The Texas Company, 135 East 42nd Street, New York, N. Y.



**THE TEXAS COMPANY**

HERE COMES THE

AMERICA'S LEADING  
RACE DRIVER WINS



AAA CHAMPIONSHIP

*with* BOWES



SPARK PLUGS

1st  
AT SPRINGFIELD 100-MILE RACE

1st  
AT SYRACUSE 100-MILE RACE

2nd  
AT INDIANAPOLIS 500-MILE RACE

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This Advertisers' Index is published as a convenience, and not as part of the advertising contract. Every care will be taken to index correctly. No allowance will be made for errors or failure to insert.

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## "NORMA-HOFFMANN" PRECISION BEARINGS

Will protect you against "come backs" and give your customers that extra-serviceability they like. They are builders of business and good will. Use these PRECISION Bearings in your replacement jobs—the same bearings that are original equipment in many of the finest cars, trucks, busses and airplanes. Write for the latest Price List and name of nearest distributor.

NORMA-HOFFMANN BEARINGS CORP'N.—STAMFORD, CONN., U. S. A.

Precision Ball, Roller and Thrust Bearings



This EXTRA  
Bearing Mileage  
is *Free*



● Size for size, Tyson Cageless Bearings have twice the average mileage of conventional cage-type bearings. This is because Tyson has replaced the space-consuming cage with extra load-carrying rolls. With more rolls to carry the load, it's easy to see why Tyson Cageless Bearings "lead a double life." Tie in with Tyson now.

*Cageless* FOR HARD SERVICE

*Cage-type* FOR REGULAR SERVICE

*Tyson*

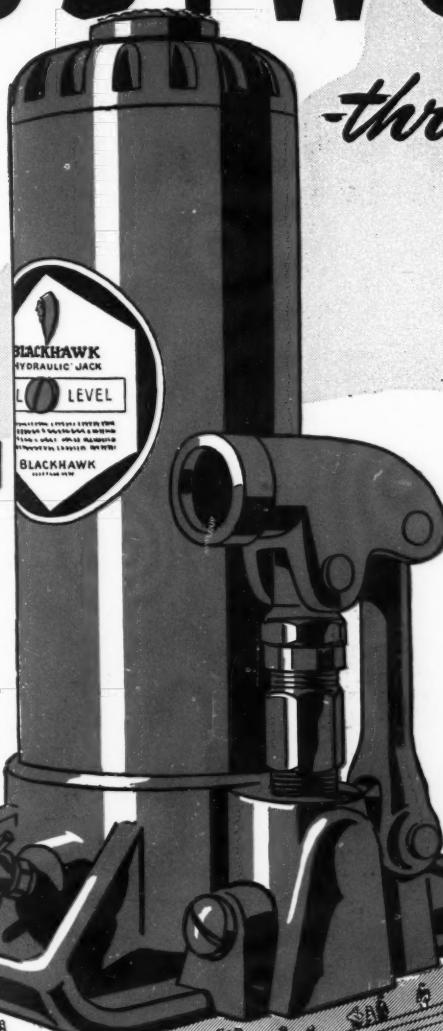
TYSON ROLLER BEARING CORPORATION, MASSILLON, OHIO

# TRUSTWORTHY

*through the years*

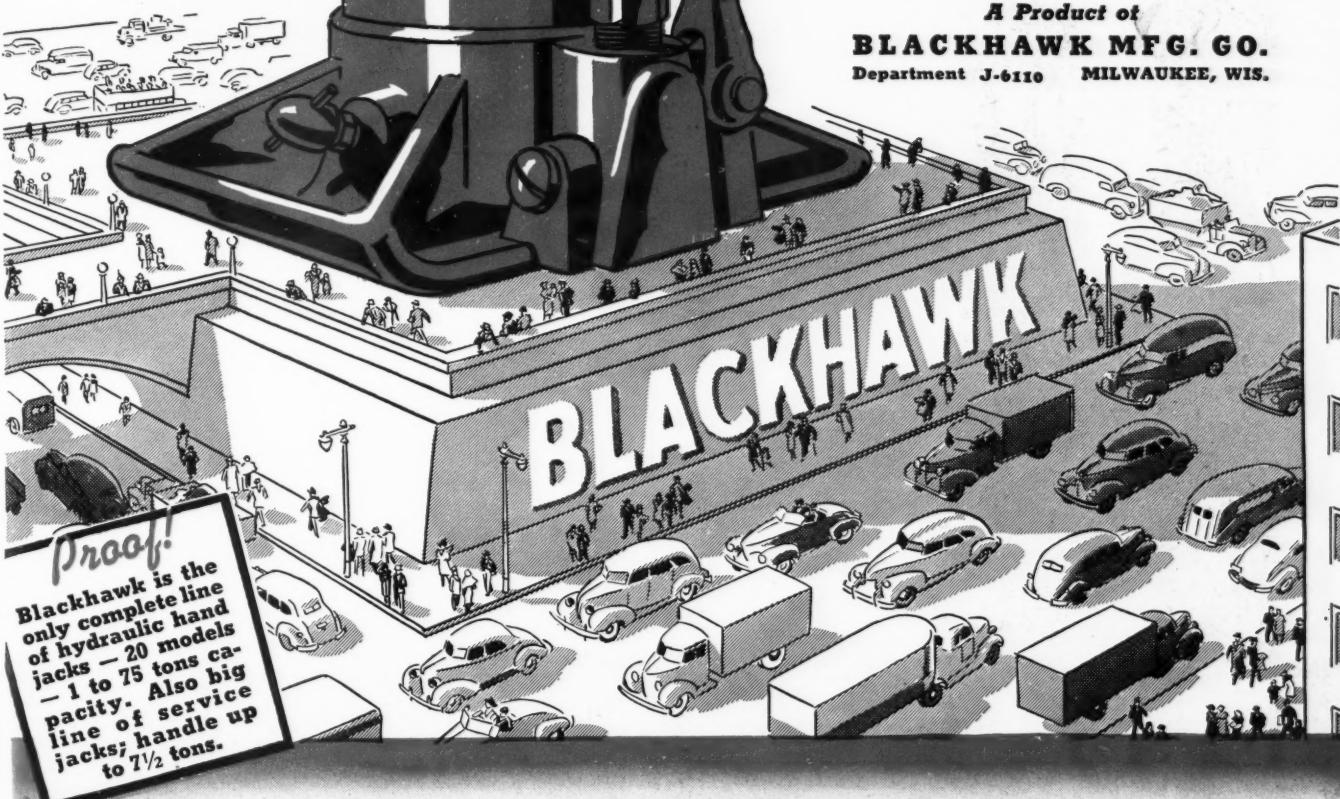


This seal is found ONLY on  
BLACKHAWK JACKS — your  
assurance of a wise investment.



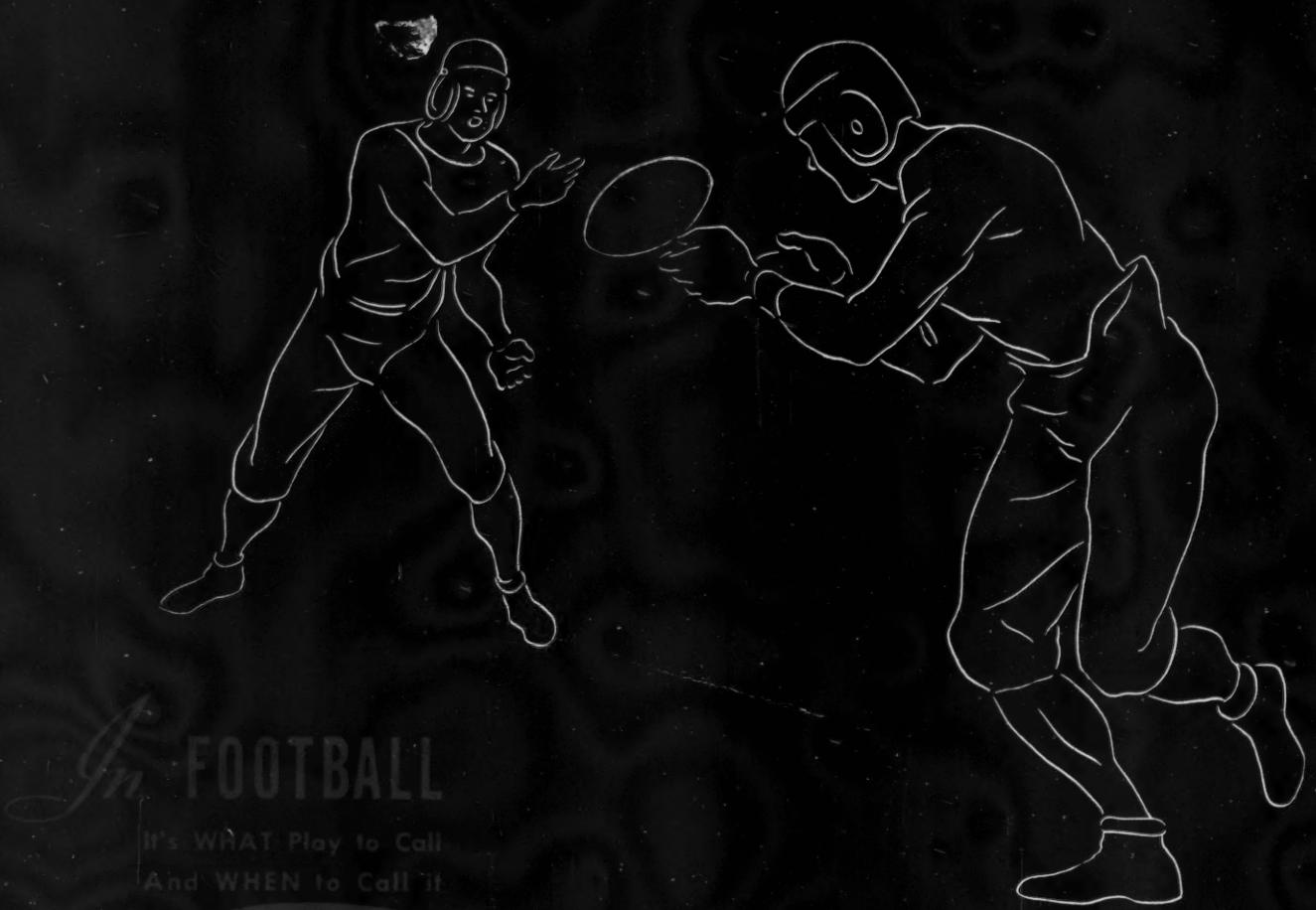
DEPENDABLE performance? Yes, sir! Thousands upon thousands of drivers, mechanics, shop and fleet operators have thrilled to the way these "Service-Proved" Hydraulics handle day-after-day jobs. Powerful, easy to operate, smooth acting, speedy. On the road or in the shop, they're always "in the groove" — saving you more time — paying you more profits — by keeping rolling stock rolling. That's the way Blackhawk Jacks have stood the test of toughest service year after year to win a reputation for unmatched dependability and trustworthiness.

A Product of  
**BLACKHAWK MFG. CO.**  
Department J-6110 MILWAUKEE, WIS.



# BLACKHAWK

MORE FOR YOUR MONEY SERVICE EQUIPMENT



## In FOOTBALL

It's **WHAT** Play to Call  
And **WHEN** to Call It

## with **PISTON RINGS**

It's **WHAT** type of piston ring set-up to  
use **WHEN** faced with one of the  
three cylinder conditions.

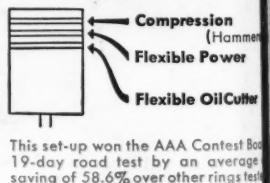
No quarterback ever took his team to victory with only one play to call signals on. And neither has any mechanic...no matter how good...ever gone through an undefeated season against ring replacement jobs with only a single type of piston ring to call on. Years of experience are behind the knowledge here at American Hammered that it takes three definitely different piston ring set-ups to cover all ring replacement jobs successfully. So make it your business right now to see to it that your mechanics have the kind of piston rings that give them the **WHAT** and **WHEN** for every ring replacement problem. **KOPPERS COMPANY**, American Hammered Piston Ring Division, Baltimore, Md.



THE CHOICE OF THOSE TO WHOM  
TRANSPORTATION IS A BUSINESS

### RE-RING JOBS

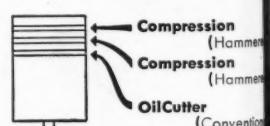
When cylinder taper is less than .015" ... and ring installation is made without cylinder correction, the correct ring installation is the American Hammered Flexible OilCutter Set-up.



This set-up won the AAA Contest Bed 19-day road test by an average saving of 58.6% over other rings tested.

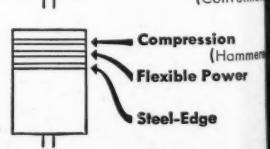
### RE-BORE JOBS

When a job is re-bored and new pistons installed, the correct ring installation is the American Hammered OilCutter Set-up.



### RE-CLAIM JOBS

For those jobs no one would formerly attempt with less than a re-bore ... and where the taper is more than .015" ... yet the customer won't pay for a re-bore ... the only correct ring installation is the American Hammered Steel-Edge Set-up.



# American Hammered Piston Rings

a K O P P E R S *product*

on  
Hammer  
power  
il Cutter  
ntest Bod  
verage  
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on  
Hammer  
on  
Hammer  
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Hammer  
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